Arizona Department of Environmental Quality

FY 2010 Nonpoint Source Program Annual Report

July 1, 2009 – June 30, 2010

Watson Lake, Prescott Arizona

ADEQ Arizona Department of Environmental Quality

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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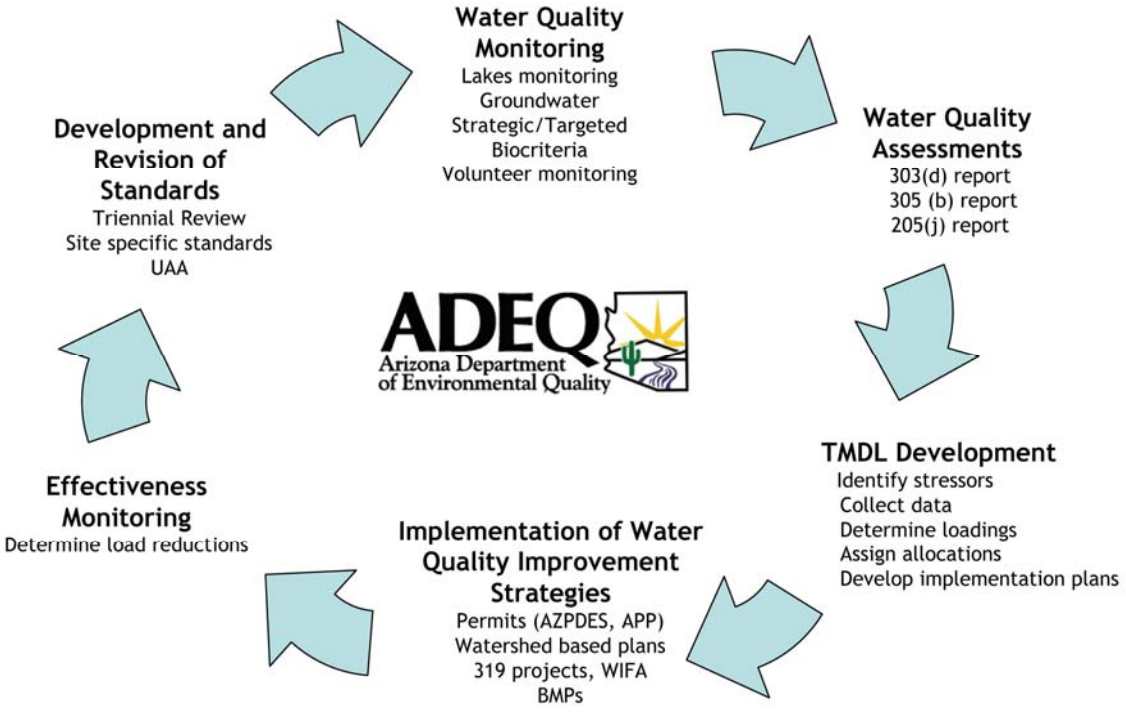
I. Purpose and Goals

Purpose of Report

Arizona's Nonpoint Source (NPS) Annual Report for Fiscal Year 2010 presents a synopsis of the Arizona Department of Environmental Quality (ADEQ) NPS Program activities for fiscal year 2010 (July 1, 2009 through June 30, 2010). The majority of work performed by ADEQ's NPS Program is funded by Clean Water Act Section 319(h) grant monies, awarded by the U.S. Environmental Protection Agency (EPA). Throughout this report, ADEQ provides a summary of progress in obtaining short- and long-term goals identified in the Arizona NPS Five –Year Management Plan (NPS Management Plan), as well as information for evaluating progress and improving the program in the future. The current NPS Management Plan is available for viewing and download on the ADEQ Web site at: http://www.azdeq.gov/environ/water/watershed/download/NPS_5-Year-Plan-2010-14.pdf.

Arizona's Nonpoint Source Program

ADEQ's NPS Program uses a combination of tools including water quality standards development, surface and ground water monitoring, water quality assessment reports, Total Maximum Daily Load (TMDL) studies, TMDL implementation plans, watershed inventories and characterizations, watershed-based plans, and Water Quality Improvement Grant (WQIG) projects to protect the state's water resources from nonpoint source pollution.



Identifying and addressing water quality concerns are part of an ongoing cycle at ADEQ.

NPS Program staff work closely with stakeholders to develop community-led, watershed-based planning efforts. These local planning efforts assist the department in developing programs and outreach activities appropriate to the specific area and current issues. ADEQ's Web site provides a list of Arizona Watershed Partnerships (www.azdeq.gov/environ/water/watershed/partnerships.html). Within these watershed partnership structures, ADEQ and its partners are able to more easily identify, assess, and help implement voluntary efforts to control nonpoint source pollution.

Since Arizona has a large amount of publicly owned lands, partnerships with federal, state and tribal land and resource management agencies are key elements in the program's success. Arizona achieves these partnerships through a variety of formal and informal agreements, cooperative projects, sharing and combining of funds, and meetings to share information and ideas. Through these partnerships, Arizona works with a variety of entities to incorporate other appropriate water quality controls and further the goals of the Nonpoint Source Program.

Arizona's NPS Program has promoted and facilitated statewide efforts to manage the impact that nonpoint source pollution has on our surface and ground water. ADEQ continues to focus efforts on restoring waters that have been listed as impaired on the Arizona Integrated 305(b) Assessment and 303(d) Listing Report, as well as protecting waters that are attaining their designated uses. For detailed information about impaired water bodies please visit: http://www.azdeq.gov/environ/water/assessment/assess.html. Also see Appendix A of this document, titled "The Impaired Water Strategy."

ADEQ's NPS Program operates primarily under the direction of the NPS Management Plan. The current State Management Plan identifies nonpoint source goals and strategies for 2010-2014, and identifies four broad goals (identified below).

Goals Identified in the 2010-2014 Arizona Nonpoint Source Five-Year Management Plan

1. Prevent and reduce nonpoint source pollution discharges to protect surface or groundwater resources.
2. Coordinate efforts of various programs within ADEQ and with other agencies and partners to reduce nonpoint source pollution impacts to surface and groundwater.
3. Identify and mitigate impairments to surface water or groundwater quality.
4. Evaluate and improve the effectiveness of the nonpoint source pollution program and communicate success.

The NPS Program is also guided by EPA's "Measure "W". "Measure W" (also known as the Watershed Improvement Measure (WIM) and SP-12) is a key performance measure in EPA's Strategic Plan (http://www.epa.gov/ocfo/plan/plan.htm). The measure tracks watersheds where water quality conditions have improved by utilizing a watershed approach. One of the primary purposes of this measure is to model and demonstrate the effectiveness of the watershed approach. EPA has a nation-wide goal to improve water quality conditions in 250 watersheds for 2012. EPA Region 9 and our state water quality agency partners have agreed to track the following watersheds for purposes of reporting on this measure and documenting environmental results, and to better focus our water quality restoration activities by identifying needs, sharing information, providing assistance and learning more about the related challenges. We expect some of these watersheds to show improvement by 2012 for the identified pollutant. Additional watersheds may be added and/or substituted.

- Boulder Creek
- Alum Gulch
- Turkey Creek
- Tonto Creek
- Pinto Creek

Arizona's Primary Nonpoint Source Pollutants

Nonpoint source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even groundwater.

Today, nonpoint source pollution remains the nation's largest source of water quality problems. It is the main reason that approximately 40 percent of our surveyed streams and lakes are not clean enough to meet basic uses such as fishing or swimming. The primary nonpoint source pollutants causing impairments in Arizona's most recent assessment (2006-2008) are:

- Suspended sediment
- Nutrients (low dissolved oxygen, high pH, nitrogen, or phosphorus) or *E. coli* bacteria
- Metals and low pH
- Selenium
- Boron
- Historic pesticides

Some lakes and streams are listed for more than one of these pollutants. The 2006-2008 Status of Ambient Surface Water Quality in Arizona (Arizona's Integrated 305(b) and 303(d) Listing Report) indicates that Arizona has 7 lakes listed for 11 different pollutants and 47 stream reaches listed for 68 different pollutants. During the 2006-2008 assessment and listing cycle, EPA listed an additional 17 lakes for 23 pollutants and 16 stream reaches for 36 pollutants. Although in a few drainages point sources may be contributing, all of these impairments are primarily the result of nonpoint source contributions.

Targeted Watersheds

Beginning in FY09 and continuing through FY10 and future fiscal years, the NPS Program has focused Water Quality Improvement Grant (WQIG) funding and technical support resources into formally identified Targeted Watersheds. These watersheds are listed below and, for ease of reference, have been grouped into two sets based on grant cycle. The progress that has been achieved in these watersheds will be detailed throughout this report.

Cycle 11 Targeted Watersheds (State FY 09-10)
Granite Creek (WQIG #11-T01)
Oak Creek (WQIG #11-T02)
San Francisco/Blue Rivers (WQIG #11-T03)

Cycle 12 Targeted Watersheds (State FY 10-11)
Little Colorado River Headwaters (WQIG #12-002)
San Pedro River (WQIG #12-003)
Tonto/Christopher Creeks (WQIG #12-007)

II. New Strategic Plan

The foundation of this 5-year Nonpoint Source Management Plan is the strategic plan presented in this chapter. It contains specific goals, objectives, and strategies that ADEQ will implement to strengthen its Nonpoint Source Program.

The strategic plan describes how resources will be allocated to achieve the mission of Arizona's Nonpoint Source Program, which is to:

> *Achieve and maintain water quality standards through the reduction of nonpoint source pollutant contributions to Arizona's surface and groundwater.*

The components of ADEQ's strategic plan:

- **Goals** – Goals are like Generals. They look at the big picture. Goals show us what the world will look like after we achieve our objectives – the desired outcomes. Goals are broad and inclusive, yet attainable and realistic.
- **Objectives** – Objectives are like Sergeants, taking directions from the Generals (goals). They describe the broad changes needed to achieve a goal.
- **Strategies** – Strategies are the foot soldiers. Strategies are specific actions needed to accomplish an objective.
- **Milestones** – Milestones are steps, stages, or phases of implementing the strategy. They allow us to determine progress in accomplishing the strategies. They may include tactics – the tools that must be developed.
- **Responsible Parties** – These are the major players who are committed to implementing the strategy.
- **Measures of Success** – Indicators of success must be chosen for each strategy. These need to be quantifiable and directed at achieving the objective or goal.

Strategic planning starts with the end in mind by establishing broad goals and objectives. Four broad goals were established for this nonpoint source strategic plan:

Goal #1: Prevent and reduce nonpoint source pollution discharges to protect surface or groundwater resources.
Goal #2: Coordinate efforts of various programs within ADEQ and with other agencies and partners to reduce nonpoint source pollution impacts to surface and groundwater.
Goal #3: Identify and mitigate impairments to surface water or groundwater quality.
Goal #4: Evaluate and improve the effectiveness of the nonpoint source pollution program and communicate success.

Objectives and strategies are then selected to achieve each goal. Definable milestones, responsible parties, and measures of success are then developed for each strategy to direct implementation of the plan and to evaluate success. Measures of success will be monitored and results analyzed to document whether and how well desired outcomes were achieved. Analyses provide the information needed to direct strategic plan changes. Annual reports to EPA will use these milestones and measures of success to report on progress.

Goal #1: Prevent and reduce nonpoint source pollution discharges to protect surface or groundwater resources.

Objective 1.A - Invest in Water Quality Improvement and Education Grants (319(h) Grants) that are likely to provide long-term load reductions and changes in behavior and to achieve watershed-wide improvements in water quality.

Strategy 1.A.1

Grant proposals must demonstrate:

- **How grant implementation will improve water quality on a watershed-scale basis**
- **That grantee has sufficient resources, technical skills, and commitments to implement and maintain the grant beyond the grant implementation cycle**
- **How the education component will encourage water quality improvements, long-term behavior changes, and encourage citizen involvement**

Milestones

- The grant manual revised to clarify grant requirements
- Grant process revised
- Technical assistance and training for grantees to improve grant proposals

Success Indicators

- Documented long-term grant project success after implementation of this objective
- More grant proposals fulfill this objective

Responsible Parties

- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 1.A.1. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. The grant manual revised to clarify grant requirements	For the FY10 grant cycle (Cycle 12), WQIG staff developed a comprehensive Request for Grant Applications (RFGA) detailing the revised grant requirements detailed under Milestone 1.A.1.2, below. This document served as the grant manual for the FY10 grant cycle. Please refer to Appendix B to review an excerpt of this RFGA.	**Grants & Outreach Unit**	**20 percent**
2. Grant process revised	The WQIG process was revised in FY10 to focus all available funding on targeted impaired watersheds, and to require all projects to address nonpoint source water quality concerns on a watershed scale. The three targeted impaired watersheds were identified as: the Little Colorado River Headwaters (sediment), Tonto and Christopher Creeks (*E. coli*, nutrients, and low dissolved oxygen), and the San Pedro River from Babocomari Creek to Dragoon Wash (*E. coli*). Applications were also restricted to three types of grants: Watershed Improvement Plans (WIPs), Watershed-scale Nonpoint Source Management (WNPS), and Watershed-scale Education and Training (WET). Please refer to Appendix B for more information about the targeted watersheds, eligible projects, and application formats.	**Grants & Outreach Unit**	**20 percent**

3. Technical assistance and training for grantees to improve grant proposals	The WQIG workshop format was adapted in FY10 to be more interactive, and to focus on the three different types of grants available and how to determine which grant opportunity best suited the applicant's situation. Three different watershed scenarios were presented to attendees, who were then broken up into small working groups to determine how they would address the problems in the watershed, identify the watershed stakeholders, and which type of grant they would apply for. Each group then explained their decision to the larger group. This method encouraged discussion among the participants and created an environment in which attendees felt comfortable asking questions. As with the previous grant cycle, pre-proposals were a required portion of the FY10 application submittal process. All applicants were provided with written comments and suggestions for improving their final applications and given the opportunity to request one-on-one meetings for further clarification.	**Grants & Outreach Unit**	**20 percent**

Objective 1.B – Encourage management practices that mitigate nonpoint source pollutant loadings.

Strategy 1.B.1

Develop a "BMP toolbox" of watershed remediation methods applicable to Arizona's hydrologic and geologic conditions and provide hands-on educational opportunities for target audiences in implementing these practices. Next 5-year focus: homeowner storm water management, recreation, grazing, septic systems, and shallow lake management.

Milestones

- BMP toolbox available on Web site with user-friendly tools
- Training and education opportunities created where needed

Indicators of success

- Use of Web site and tools documented
- Demonstration sites visited
- New improvement projects associated with Web site use and demonstration site visits

Responsible Parties

- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)
- TMDL Program

Strategy 1.B.1 Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. BMP toolbox available on Web site with user-friendly tools	AZ NEMO submitted a draft BMP manual to ADEQ for review 6/10. Under their 2010-2012 contract, they will revise and update this manual, and further adapt it for use as a web-based tool.	**Grants & Outreach Unit**	**25 percent**

2. Training and education opportunities created where needed	Not addressed during FY10.	**Grants & Outreach Unit, TMDL**	**0 percent**

Strategy 1.B.2

Complete state-wide watershed-based plans for use by local watershed partners that:

- **Characterize the watershed**
- **Identify pollutants of concern**
- **Determine high-risk sub-watersheds for specific pollutants groups**
- **Include EPA's nine key elements for a watershed plan**

Milestones

- Plans completed for the last four watersheds: Colorado-Grand Canyon, Colorado-Lower Gila, San Juan (part of the Little Colorado), and the San Pedro.
- Education and training about these watershed-based plans for government leaders, resource managers, and other watershed partners
- Interactive Mapping Service available on line so interested watershed partners can work with GIS covers used to develop these plans

Indicators of success

- Pollutant loading reductions in watershed because Information in plans used to:
  - Initiate new water quality improvement projects
  - Institute new land management decisions
  - Implement new BMPs

Responsible Parties

- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)
- Watershed Partners

Strategy 1.B.2 Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. Plans completed for the last four watersheds: Colorado-Grand Canyon, Colorado-Lower Gila, San Juan (part of the Little Colorado), and the San Pedro.	Plans for the last four watersheds were completed by AZ NEMO. Final plans were submitted to EPA in June of 2010, and are available on the AZ NEMO Web site at the following location: http://nemo.srnr.arizona.edu/nemo/index_old.php?page=characterization These plans complete watershed based plan coverage for Arizona' 10 8-digit HUC watersheds.	**Grants & Outreach Unit**	**100 percent**
2. Education and training about these watershed-based plans for government leaders, resource managers, and other watershed partners	Not addressed during FY10. NEMO will conduct four workshops to discuss and present each of the four plans mentioned in Milestone 1.B.2.1 during their 2010-2012 contract period with ADEQ.	**Grants & Outreach Unit**	**0 percent**

3. Interactive Mapping Service available on line so interested watershed partners can work with GIS covers used to develop these plans	The IMS is accessible on the AZ NEMO Web site (www.arizonanemo.org). AZ NEMO will continue to update GIS covers and provide training to WQIG targeted watersheds under their 2010-2012 contract with ADEQ.	**Grants & Outreach Unit**	**90 percent**

Objective 1.C – Encourage the use of legal authorities to reduce nonpoint source contributions to surface or groundwater, rather than relying on voluntary actions.

Strategy 1.C.1

Educate watershed partners about potential legal authorities to control nonpoint source loadings to surface or groundwater. Examples include, but are not limited to:

- **Existing state and federal regulations (aquifer protection (A.A.C. R18-9), nitrogen management areas (A.A.C. R18-9), pesticide use and disposal (A.A.C. R18-6), hazardous waste use and disposal practices (A.A.C. R18-8), underground storage tanks (A.A.C R18-12), solid waste disposal regulations (A.A.C R18-13)**
- **Federal or state land use or permit restrictions (e.g., grazing permits, off-road vehicle use areas, road closures, MS4 permits)**
- **Local planning and zoning restrictions – existing and potential ordinances**

Milestones

- Education materials and training opportunities for watershed partners (e.g., authorities, process, where best used, and contact for info)

Success Indicators

- Watershed partners use legal authorities to reduce pollutants of concern.

Responsible Parties

- Aquifer Protection Permit Program
- Hazardous Waste Program
- Solid Waste Program
- Underground Storage Tanks Program
- Pesticide Program (Arizona Department of Agriculture)
- AZPDES Permits, including Storm Water Management
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 1.C.1 Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. Education materials and training opportunities for watershed partners (e.g., authorities, process, where best used, and contact for info)	Not addressed during FY10.	**Grants & Outreach Unit**	**0 percent**

Strategy 1.C.2

Identify methods for using land use management and written agreements to assure long-term load reductions for water quality improvement grants (319(h) Grants). For example, use of conservation easements, deed restrictions, Memorandums of Understanding.

Milestones:

- Education materials and training for watershed partners
- Water Quality Improvement Grant agreement procedures modified to incorporate written agreements that better assure long-term load reductions.

Success Indicators

- Land management restrictions are used to assure load reductions.
- Grant project evaluations show that written agreements incorporated into grant process have assured project effectiveness well beyond the two year grant period.

Responsible Parties

- Grants and Outreach, including 319 grants (e.g., NEMO and Master Watershed Stewards)

Strategy 1.C.2 Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. Education materials and training for watershed partners	Contact has been made with the Arizona Land and Water trust to initiate the development of materials or workshops regarding conservation easements and Section 319(h) funding during FY 11.	**Grants & Outreach Unit**	**5 percent**
2. Water Quality Improvement Grant agreement procedures modified to incorporate written agreements that better assure long-term load reductions.	Not addressed during FY10.	**Grants & Outreach Unit**	**0 percent**

Goal #2 Coordinate efforts of various programs within ADEQ and with agencies and partners to reduce nonpoint source pollution impacts to surface and groundwater.

Objective 2.A - Encourage public involvement and locally-driven efforts.

Strategy 2.A.1

Empower watershed partners to develop and implement watershed improvement and education projects by providing technical assistance, education, and training.

Milestones

- Target education grants to provide needed technical assistance, education, and training for watershed partners
- Provide education and training opportunities on water quality topics of concern as requested by watershed partners, such as: sampling, credible data requirements, data tracking, field survey methods to identify pollutant sources and remediation projects, GIS mapping and modeling capabilities, grant writing

Indicators of success

- Increased knowledge results in more effective project implementation, higher load reductions, and more commitment to continue water quality improvements.
- Grant proposals submitted by watershed partners require less revision and less direct assistance from ADEQ staff to develop or implement.
- Monitoring data collected by watershed partners meet Credible Data requirements and can be used by ADEQ for assessments.
- Modeling, mapping, and GIS analyses available at Web site are used by local watershed partners to support water quality improvement project development.

Responsible Parties

- ADEQ Nonpoint Source Programs
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 2.A.1. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. Target education grants to provide needed technical assistance, education, and training for watershed partners	The WQIG program awarded a total of five education-based contracts during FY10. Two Watershed-scale Education and Training Grants were awarded (#12-002, #12-007) to provide nonpoint source impairment-specific education and training to watershed stakeholders. Three contracts were developed with the University of Arizona (EV11-0009, EV11-0010, EV11-0011) to fund AZ NEMO Program, Master Watershed Steward Program, and Dr. Channah Rock. Each entity will provide technical support and training services to ADEQ-identified targeted watersheds. An additional contract (EV11-0008) was awarded to the U of A to fund Project WET Water Festivals, providing statewide youth education regarding water and water quality. Please see Appendix C for a full list of projects awarded in FY10.	**Grants & Outreach Unit**	**20 percent**

2. Provide education and training opportunities on water quality topics of concern as requested by watershed partners, such as: sampling, credible data requirements, data tracking, field survey methods to identify pollutant sources and remediation projects, GIS mapping and modeling capabilities, grant writing	Grants and Outreach and TMDL staff worked closely with watershed stakeholders throughout FY10 to provide watershed-specific education and training. Efforts were focused in watersheds identified as targeted by the WQIG Program, as well as in watersheds where active TMDL studies or effectiveness monitoring were taking place. These watersheds include the Little Colorado River watershed (non-targeted area) and the Tonto Creek Watershed, where effectiveness monitoring activities were initiated prior to selecting that area as a target.	**Grants & Outreach Unit**	**20 percent**

Objective 2.B - Encourage land and resource management agencies and tribal authorities to identify and mitigate nonpoint source pollution impacts in Arizona.

Strategy 2.B.1

Strengthen working relationships with other agencies and tribes to encourage development of effective water quality improvement projects and avoid projects or practices that would contribute to impairment of surface or groundwater quality.

Milestones

- Memorandums of Understanding with other agencies and tribes updated to better support this 5-year strategic plan.
- ADEQ participation in coordinated resource planning efforts of federal and state agencies (e.g., planning, federal action reviews).
- Coordinate with other agencies to leverage funding opportunities, especially for priority projects within impaired watersheds (Objective 3.B.1).
- Tribal participation in watershed planning, educational opportunities, and priority water quality improvement project implementation.
- Meetings are held to determine and initiate new strategies to mitigate pollutant loadings

Indicators of success

- New strategies identified and implemented resulting in reduced pollutant loadings.
- Funds from multiple funding sources used to implement priority water quality improvement projects.
- More tribal representation in planning and watershed partner meetings.
- Tribal 319(h) grant proposals reflect a watershed approach to identify priority projects.

Responsible Parties

- ADEQ Nonpoint Source Programs
- Federal and state agencies who have signed MOUs with ADEQ
- ADEQ and EPA tribal liaisons
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 2.B.1. Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. Memorandums of Understanding with other agencies and tribes updated to better support this 5-year strategic plan	No MOUs were completed or updated during FY10. A list of current MOUs is being developed, and ADEQ will continue to work with both new and existing partners to update and create MOUs that will allow the use of joint resources to address nonpoint source pollution throughout the state. ADEQ will focus future update efforts on MOUs with agencies in our targeted watersheds as they are identified. This includes the Bureau of Land Management, the State Lands Department, and the Arizona Game & Fish Department.	**Grants & Outreach Unit**	**10 percent**
2. ADEQ participation in coordinated resource planning efforts of federal and state agencies (e.g., planning, federal action reviews)	The WQD provided comments on approximately 160 environmental reviews received from various federal, state, and local agencies. The environmental reviews seek comments on potential environmental impacts from proposed projects, including sand and gravel operations leased on state lands, solar projects constructed on federal land, or rehabilitation projects using state funds. This process encourages the mitigation of nonpoint source impacts on water quality whenever a federal action is being considered. WQD also participated in federal and state agency planning efforts such as the October 2009 NRCS State Technical Meeting and the Arizona Forest Stewardship Committee. In addition, the TMDL Unit coordinates activities with USFS on-scene coordinator regarding remedial activities on USFS lands. Discussions center upon current and ongoing USFS and ADEQ studies to see where resources can be combined to collect the necessary data to fulfill each agencies needs.	**Section-wide**	**20 percent**
3. Coordinate with other agencies to leverage funding opportunities, especially for priority projects within impaired watersheds (Objective 3.B.1) *Please see Appendix C for additional information regarding federal support for WQIG projects.*	WQIG projects awarded during FY10 had additional support in the form of funding and/or in-kind match from the following entities: • Arizona Department of Water Resources • Arizona State Land Department • Arizona Game and Fish Department • Arizona Department of Transportation • Little Colorado River Resource Conservation and Development Area • Coronado Resource Conservation and Development Area • Cochise County • Gila County • Pima Association of Governments • University of Arizona • Tucson Department of Transportation	**Grants & Outreach Unit**	**20 percent**

4. Tribal participation in watershed planning, educational opportunities, and priority water quality improvement project implementation	The WQIG Program provided funding for three projects taking place on tribal lands and/or providing education to tribal communities. These projects were with the San Carlos Apache (WQIG #10E-016: The Dzil Nchaa Sia'an Youth Practicum Project), White Mountain Apache (WQIG #10-005: White Mountain Apache Tribe Water Quality Improvement Project) and Hualapai (#10-002: Sediment Reduction into Diamond Creek and the Colorado River) tribes.	**Grants & Outreach Unit**	**20 percent**

Goal #3: Identify and eliminate impairments to surface water or groundwater quality.

Objective 3.A – Assess water quality of surface waters and groundwater.

Strategy 3.A.1

Perform state-wide surface and groundwater quality monitoring according to ADEQ's Monitoring Strategy (revised 2007) and analyze data to fulfill requirements of the Clean Water Act and state water statutes.

Milestones

- State-wide surface water monitoring is completed in a three year cycle.
- Groundwater quality is characterized and reported for watershed partner use.
- ADEQ submits assessment report, assessment database, and list of impaired waters every two years to EPA.
- Impaired waters list and supporting GIS maps updated and available on internet

Indicators of success

- ADEQ continues to submit superior quality assessment and impaired waters identification reports that are approved by EPA.
- Groundwater basin reports complete at least one report per year.

Responsible Parties

- Ambient Monitoring Program
- Assessment Program

Strategy 3.A.1. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. State-wide surface water monitoring is completed in a three year cycle	ADEQ continues to work with the United States Geological Survey (USGS), under a long-standing cooperative agreement, to determine long term water quality trends on Arizona's larger rivers. For fiscal year 2009, the USGS monitored 11 sites throughout the state for ADEQ. Monitoring has been completed for all three monitoring regions (Appendix D).	**Ambient Monitoring Program**	**20 percent**
2. Groundwater quality is characterized and reported for watershed partner use	Due to budget cuts no groundwater monitoring was done this year. Field staff is limited to one employee. During FY10 Doug Towne completed reports for the Gila Valley sub-basin and the McMullen basin. A draft copy of the Dripping Springs basin report is being reviewed and is expected to be finalized in August 2010.	**Ambient Monitoring Program**	**0 percent**

3. ADEQ submits assessment report, assessment database, and list of impaired waters every two years to EPA	Nearly all watersheds have been evaluated and are currently being re-formatted into the 305(b)/303(d) document	**Assessment Program**	**30 percent**
4. Impaired waters list and supporting GIS maps updated and available on internet	Most impaired waters have been identified but no list has been drafted and GIS work has not begun.	**Assessment Program**	**20 percent**

Strategy 3.A.2

<u>In-stream water quality sampling data submitted to ADEQ</u> to evaluate effectiveness of grants or treatment, ambient conditions, or impacts from potential pollutant sources:

- **Is reliable, scientifically based, and meets credible data requirements established for listing impaired waters**
- **Is formatted so it can easily be loaded into ADEQ's database**
- **Includes supporting metadata needed to properly interpret the water quality data**
- **Is collected using protocols established by ADEQ, if applicable standards would require these protocols**

Milestones

- Current ADEQ's sampling methods and protocols are available over the internet
- Components of the Sampling Analyses Plans (SAPs) and Quality Assurance Plans (QAPs) required to meet credible data requirements are either provided in the permit or submitted to ADEQ with all in-stream surface water quality data
- The potential value of in-stream sampling requirements are considered for all AZPDES Permits, especially if the discharge might impact an impaired surface water
- Guidance documents establish credible data and submittal requirements, including supporting metadata requirements.

Indicators of success

- Monitoring data submitted to ADEQ meets credible data requirements, contains supporting metadata, and is easily loaded into ADEQ's database.

Responsible Parties

- Ambient Monitoring Program
- TMDL Program
- AZPDES Permit Programs
- Compliance and Enforcement
- Assessment Program
- Data Management Program
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 3.A.2. Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. Current ADEQ's sampling methods and protocols are available over the internet	Standard operating procedures have been updated in 2010 and are available at http://www.azdeq.gov/environ/water/assessment/riverandstream.html	**Ambient Monitoring Program, TMDL Program**	**100 percent**
2. Components of the Sampling Analyses Plans (SAPs),Quality Assurance Plans (QAPs), and Monitoring Plans required to meet credible data requirements are either provided in the permit or submitted to ADEQ with all in-stream surface water quality data	Permits Unit is working to develop improved permit language for those AZPDES permits which require ambient surface water quality monitoring in order to ensure the data collected will meet ADEQ credible data requirements. The Permits Unit will be coordinating with the Ambient Monitoring and Assessment Programs to ensure appropriate guidance documents are available to permittees and referenced in the permits.	**Grants & Outreach Unit, Permits Unit, Stormwater and General Permits Unit**	**20 percent**
3. The potential value of in-stream sampling requirements is considered for all AZPDES Permits, especially if the discharge might impact an impaired surface water	Boilerplate permit language has been revised to require permit writers to consider these issues when processing permit applications. Criteria will be developed to ensure in-stream monitoring requirements are incorporated into new and renewal permits when appropriate.	**Permits Unit**	**50 percent**
4. Guidance documents establish credible data and submittal requirements, including supporting metadata requirements	Most of the guidance document has been drafted; however there are still a few on-going modifications that will be included at a later time.	**Assessment Program**	**70 percent**

Strategy 3.A.3

Develop and implement new tools, water quality standards, and sampling methods to support water quality assessments and identification of impairments, sources, and key projects.

Milestones

- Water quality standards developed or revised in accord with the Triennial Review Process.
- EPA's Environmental Monitoring and Assessment Program (EMAP) random monitoring approach is adapted for use in Arizona's arid environment.
- Arizona's Impaired Water Identification Rule is revised to incorporate new water quality standards and better reflect EPA's impaired waters listing guidance.
- New components are developed for Arizona's Assessment Calculator (AZAC) to provide computer assisted data analyses for water quality assessments.
- A data submittal process is established so that external data can be readily loaded into ADEQ's Water Quality Database.
- New methods developed to survey watersheds and to identify sources and key project sites that will significantly address impairments.
- Develop new databases to track field survey data and new methods to interpret field survey data.

Indicators of success

- Arizona assesses a higher percentage of perennial waters.
- Fewer surface waters must be added by EPA to Arizona's 303(d) List of impaired waters.
- Assessment reports are completed in a timely manner.
- New methods provide scientifically reliable evidence of source contributions
- New water quality improvement projects significantly reduce pollutant loading and lead to delisting of water quality impairments

Responsible Parties

- Ambient Monitoring Program
- TMDL Program
- Assessment Program
- Rule Development Program
- Data Management Program
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 3.A.3. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. Water quality standards developed or revised in accord with the Triennial Review Process	The revised Surface Water Quality Standards Rules were finalized on January 31, 2009. ADEQ is in the process of identifying proposed changes for the 2012 triennial review.	**Assessment Program**	**40 percent**

2. EPA's Environmental Monitoring and Assessment Program (EMAP) random monitoring approach is adapted for use in Arizona's arid environment	The Ambient Monitoring Program completed a random sampling approach for wadeable perennial streams in Arizona for 50 sites. A final report will be completed in 2011.	**Ambient Monitoring Program**	**90 percent**
3. Arizona's Impaired Water Identification Rule is revised to incorporate new water quality standards and better reflect EPA's impaired waters listing guidance	Arizona's Impaired Water Identification Rule established methods and criteria for identifying impaired waters and developing a Total Maximum Daily Load analysis. This rule was adopted in 2002 and is currently undergoing revisions to incorporate new procedures for identifying impaired waters based on violations of narrative water quality standards. Once the draft revisions are approved by management, a new draft will be released for review and stakeholder meetings will be scheduled. The Impaired Waters Rule impacts the Nonpoint Source Program's direction because any modifications to the Rule will become program priorities, creating a shift in our goals for grant funding and deliverables. There is no timeframe for new rules because all rule development is on hold due as stipulated by State of Arizona Legislature.	**Assessment Program**	**40 percent**
4. New components are developed for Arizona's Assessment Calculator (AZAC) to provide computer assisted data analyses for water quality assessments	No was done to develop new components for AZAC. Work is expected to begin once the 2010 assessment is submitted to EPA.	**Assessment Program**	**0 percent**
5. A data submittal process is established so that external data can be readily loaded into ADEQ's Water Quality Database	Relatively little work was done to develop a data submittal process. Research is still being conducted in order to determine the best approach.	**Assessment Program**	**30 percent**
6. New methods developed to survey watersheds and to identify sources and key project sites that will significantly address impairments	Grants & Outreach and TMDL staff worked closely with the Cycle 11 Targeted Watersheds to develop watershed survey methods. These methods will be used in conjunction with water quality data and watershed modeling outputs to identify priority sites for implementation projects in each of the three watersheds. ADEQ staff will continue to work with Cycle 12 and future WIPs to further develop these methods.	**TMDL Program, Grants & Outreach Unit**	**20 percent**
7. Develop new databases to track field survey data and new methods to interpret field survey data	Arizona NEMO began preliminary development of unique databases for each of the three Cycle 11 Targeted Watersheds during FY10.	**Grants & Outreach Unit**	**20percent**

Objective 3.B - Target resources in watersheds with impaired waters to identify sources and implement plans to reduce pollutant loadings.

Strategy 3.B.1

Establish an intra-agency team and an external partnership for each impaired surface waters to help identify and implement new strategies to mitigate impairments.

Milestones

- High priority impaired watersheds are identified for targeting resources such as 319(h) Grant resources, educational opportunities, and potential legal authorities.
- Two types of teams are created to identify resources and potential actions for high priority watersheds.
  - A multi-programmatic ADEQ team with a focus on legal authorities
  - A multi-agency team with watershed partners to identify and implement other strategies

Indicators of success

- New strategies are developed and implemented that result in water quality improvements

Responsible Parties

- Federal and State Agencies with MOUs
- ADEQ Permit Programs (AZPDES, APP, etc)
- Monitoring and Assessment Programs
- TMDL Program
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 3.B.1. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. High priority impaired watersheds are identified for targeting resources such as 319(h) Grant resources, educational opportunities, and potential legal authorities	Boulder Creek was identified as a funding priority, pending cooperation of external partners. The NPS Program continues to work to identify alternative funding priorities.	**Grants & Outreach Unit**	**10 percent**
2. Two types of teams are created to identify resources and potential actions for high priority watersheds: ▪A multi-programmatic ADEQ team with a focus on legal authorities ▪A multi-agency team with watershed partners to identify and implement other strategies	WQD staff from the Surface Water Section Grants & Outreach and TMDL units, Compliance Section, and Division Director's Office met internally to discuss potential actions to address impairment issues in Boulder Creek. External team development is on hold pending involvement commitments from external partners.	**Grants & Outreach Unit**	**10 percent**

Strategy 3.B.2

Assist locally-driven efforts to develop and implement Watershed Improvement Plans (WIPs) in targeted watersheds that identify water quality improvement projects, education and training needs, and other actions needed to mitigate impairments.

Milestones

- Watershed Improvement Council establishment and education
- Volunteers trained to conduct field surveys and water quality sampling
- Methods for field surveys and sample collection are developed, approved by ADEQ staff, and implemented
- Field surveys, sample collections, and other information are analyzed to identify key project sites
- Project sites are prioritized and best options for mitigating pollutant loading identified
- Planning documents are finalized
- 319(h) Grant fund used to implement plans, as appropriate

Indicators of success

- Watershed plans fulfill EPA's nine key elements for a watershed plan.
- Implementation is initiated through locally-driven efforts.
- Measurable improvements in water quality after implementation of projects.

Responsible Parties

- Federal and State Agencies with MOUs
- ADEQ Permit Programs (AZPDES, APP, etc)
- Monitoring Program
- TMDL Program
- Assessment Program
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 3.B.2. Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. Watershed Improvement Council establishment and education	Watershed Improvement Councils (WICs) were formed during FY10 for the Cycle 11 Targeted Watersheds. Funding was also awarded to support the formation of WICs in two of the Cycle 12 Targeted watersheds (San Pedro River and LCR Headwaters).	**Grants & Outreach Unit**	**20 percent**
2. Volunteers trained to conduct field surveys and water quality sampling	Volunteers have been trained in the Cycle 11 Targeted Watersheds. Funding was also awarded to support volunteer training in the Cycle 12 Targeted Watersheds.	**Grants & Outreach Unit, TMDL Program**	**20 percent**
3. Methods for field surveys and sample collection are developed, approved by ADEQ staff, and implemented	Methods for field surveys and sample collection have been developed for the Cycle 11 Targeted Watersheds. Portions of these plans were approved during FY10, allowing for surveys and sample collection to begin in all three of these watersheds.	**Grants & Outreach Unit, TMDL Program**	**20 percent**

4. Field surveys, sample collections, and other information are analyzed to identify key project sites	Analysis of land use data to inform modeling inputs began in all three Cycle 11 Targeted Watersheds during FY10. Preliminary analysis of field survey and sampling data began in both the Granite Creek and San Francisco/Blue River watersheds during FY10.	**Grants & Outreach Unit, TMDL Program**	**20 percent**
5. Project sites are prioritized and best options for mitigating pollutant loading identified	No activity during FY10.	**Grants & Outreach Unit**	**0 percent**
6. Planning documents are finalized	No activity during FY10. Planning documents for the Granite Creek, Oak Creek, and San Francisco/Blue River WIPs are scheduled to be submitted to ADEQ by 6/30/11. Planning documents for the San Pedro River WIP are scheduled to be submitted to ADEQ by 6/30/12.	**Grants & Outreach Unit**	**0 percent**
7. 319(h) Grant funds used to implement plans, as appropriate	While no WIPs have reached the implementation phase at this time, four of the eight WQIG projects awarded during FY10 were supported by a completed TMDL and/or a completed AZ NEMO Watershed Based Plan (Appendix C).	**Grants & Outreach Unit**	**20 percent**

Strategy 3.B.3

Develop and implement TMDLs to identify source contributions and load reductions needed to meet standards.

Milestones

- Scientifically-based TMDLs are developed according to the TMDL schedule.
- Status of TMDL development and existing TMDLs are available for stakeholders.
- Public involvement in TMDL Implementation Plan (TIP) development and implementation
- Nonpoint Source Grant funds used to implement TIP as appropriate

Indicators of success

- EPA approves ADEQ's TMDLs.
- TMDL implementation results in pollutant reductions

Responsible Parties

- Federal and State Agencies with MOUs
- ADEQ Permit Programs (AZPDES, APP, etc)
- Monitoring & Assessment Programs
- TMDL Program
- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)

Strategy 3.B.3 Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. Scientifically-based TMDLs are developed according to the TMDL schedule	No TMDLs were submitted for approval in FY10. However 11 TMDLs (6 Hg impaired lakes in Lake Mary Regional Mercury TMDLs and 5 stream segments in the Oak and Spring Creek *E. coli* TMDLs) were public noticed at the end of FY10 for submission to EPA by the end of the federal FY10.	**TMDL Program**	**0 percent**
2. Status of TMDL development and existing TMDLs are available for stakeholders	The TMDL Web site is updated regularly and updates are provided when attending watershed group meetings (http://www.azdeq.gov/environ/water/assessment/tmdl.html).	**TMDL Program**	**20 percent**
3. Public involvement in TMDL Implementation Plan (TIP) development and implementation	Little internal TIP development occurred in FY10 due to assigned staffing issues. Public input was sought for the brief TIP developed for the Oak Creek TMDL but implementation will begin when the WIP is complete.	**TMDL Program**	**0 percent**
4. Nonpoint Source Grant funds used to implement TIP as appropriate	No activity during FY10.	**Grants & Outreach Unit**	**0 percent**

Goal #4: Evaluate and improve the effectiveness of the Nonpoint Source Program and communicate success.			
Objective 4.A - Evaluate ADEQ's Water Quality Improvement Grants (319 Grants) and TMDLs to determine their effectiveness at creating long-term reductions in pollutant loadings.			
Strategy 4.A.1 Progress Summary			
Milestone	**Progress**	**Responsible Party**	**Percent Complete**
1. ADEQ staff will evaluate effectiveness of education and on-the-ground improvement projects several years after the final project closeout	A framework for evaluating closed projects was developed during FY09. Staffing shortages prohibited site visits beyond those conducted for active and recently closed out projects during FY10.	**Grants & Outreach Unit**	**10 percent**
2. TMDL effectiveness is determined five years after completing the TMDL based on samples collected during critical conditions when past exceedances had occurred	ADEQ understands the importance of quantifying load reductions on a watershed, water body, and project level. However, quantifiable proof of NPS load reduction estimates is difficult to obtain. Per Arizona statute, ADEQ will review the status of each water body where a TMDL study has been performed, as least once every five years to determine if compliance with applicable surface water quality standards has been achieved. TMDL effectiveness monitoring occurred in Tonto Creek, Alum Gulch, Little Colorado River, and Turkey Creek in FY10.	**TMDL Program**	**20percent**
3. All grant projects have a monitoring component that measures water quality improvements and/or determines long-term behavioral changes	All WQIG projects awarded during FY10 were required to identify measures of success and strategies to monitor water quality improvements and long term behavioral changes that would occur as a result of the grant.	**Grants & Outreach Unit**	**20 percent**
4. Submit load reduction reports for nutrients and sediment reductions to EPA using their Grant Reporting and Tracking System	Load reduction estimates were entered into GRTS for nine projects during State FY10. The load reductions associated with these projects totaled 36,218 lbs of nitrogen, 7,482 lbs of phosphorus, and 25,118 tons of sediment. Please see Appendix E for additional information.	**Grants & Outreach Unit**	**20 percent**
5. Develop better methods for determining load reductions of all types of pollutants in arid conditions	ADEQ has contracted with AZ NEMO to calculate load reductions for WQIG projects that will reduce nitrogen, phosphorus, and/or sediment and will not be conducting monitoring sufficient to provide their own load reduction data. AZ NEMO will utilize the AGWA program to calculate load reduction data under their 2010-2012 contract.	**Grants & Outreach Unit**	**20 percent**

Objective 4.B – Communicate Nonpoint Source Program successes and lessons learned.

Strategy 4.B.1

Document "success stories" or "lessons learned."

Milestones

- Grantees provide information and graphics in their final reports for these stories.
- Grant and TMDL effectiveness documented and communicated to the public.

Indicators of success

- Stories increased public awareness of these programs.
- Grant proposal methods reflect past successes and lessons learned.

Responsible Parties

- Grants and Outreach Program and grantees (e.g., NEMO, Master Watershed Stewards)
- TMDL Program

Strategy 4.B.1 Progress Summary

Milestone	Progress	Responsible Party	Percent Complete
1. Grantees provide information and graphics in their final reports for these stories.	All final reports submitted to ADEQ during FY10 were in accordance with the final report format revised in FY09. This format follows the EPA 319(h) Success Story format to allow for smooth transition between final reports and success story submissions. The report format is available for download on ADEQ's Web site at http://www.azdeq.gov/environ/water/watershed/download/final.doc Examples of two final reports can be found in Appendix F.	**Grants & Outreach Unit**	**20 percent**
2. Grant and TMDL effectiveness documented and communicated to the public.	TMDL effectiveness data is shared with the watershed groups as it becomes available via emails and in-person updates	**Grants & Outreach Unit, TMDL Program**	**20 percent**

Appendix A: The Impaired Water Strategy

ADEQ has a comprehensive strategy for improving water quality on Arizona's impaired waters that will lead to these waters meeting standards. The TMDL and WQIG programs bring together the resources needed to move the surface water through a series of steps or levels until the impairment has been mitigated and the stream or lake is meeting standards for the pollutants of concern. A spreadsheet was developed which tracks progress of each impaired lake or stream as it moves generally from Level A to F. The six (6) levels are:

- **Level A – Investigate and develop TMDL.**
  Most impaired waters start in Level A. The TMDL Program will develop further monitoring data to determine the extent of impairment (e.g., seasonality, area), likely sources, and develop a Total Maximum Daily Load (TMDL) that indicates the load and waste load reductions needed for the surface water to meet standards.
- **Level B – Develop a plan or other strategy that identifies and prioritizes effective water quality improvement projects.**
  This step is key to diminishing the pollutant sources and impacts and may be initiated even before a TMDL has been completed if there is adequate local support for development of a plan or if the land owner wishes to actively remediate the pollution. If the pollutant can be mitigated easily, a formal TMDL may not be necessary. Watershed Improvement Plans, TMDL Implementation Plans, or other formal strategies developed must include EPA's nine key elements of a watershed plan. These plans include a load or waste load reduction estimation, although not at the level of sophistication of a TMDL. If a TMDL has been completed first, the surface water automatically moves to Level B for development of the TMDL Implementation Plan (i.e., TIP). ADEQ works with watershed groups, other agencies, land owners, and other interested parties in Level B phase, bringing in expertise needed to identify and technically evaluate key projects.
- **Level C – Implement the plan or other strategy.**
  Level C - Surface waters move to Level C when the Watershed Improvement Plans, TMDL Implementation Plan, or other strategy is being implemented. Implementation may take years and require multiple phases.
- **Level D – Re-evaluate impairment due to watershed improvements, new standards, or natural conditions.**
  The impairment decision will be re-evaluated when water quality improvements are implemented, when relevant water quality standards change, or when preliminary data indicates that pollutants are solely due to natural conditions. New data are collected during this stage during critical conditions (conditions when exceedances have occurred in the past).
- **Level E – Request removal from Arizona's impaired water list.**
  If the data evaluation indicates that the surface water is no longer impaired by the pollutant(s) of concern, the surface water moves to this level for a short time. This level reflects the reality that surface waters must be officially removed from the impaired waters list, and this may take time.
- **Level F – Assign to EPA because ADEQ lacks jurisdiction (e.g. pollutant source are entirely in Mexico).**
  When all pollutant sources are outside of Arizona, particularly in Mexico, EPA will be notified and will be expected to take the lead in implementing pollutant mitigation actions. The spreadsheet shown in this appendix is a tool to coordinate efforts between several of ADEQ's programs and help focus efforts and funding opportunities with other federal, state, and local agencies. Improving water quality on *all* surface waters listed as impaired is a high priority for ADEQ, so the level does not infer a priority.

The following table is a slightly abridged version of the spreadsheet kept by ADEQ. The discharges under permit are not shown in this version due to space constraints.

Appendix A: Impaired Waters Table for FY10

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Alamo Lake	Mercury in fish (2002 by EPA) (ADEQ had it listed prior 2002)	TMDL being redrafted to included updated data	Mining Air deposition	Proposed: Identify, prioritize, and remediate mining sites in drainage, especially adjacent to streams and washes.	
A	Alamo Lake	Ammonia (2004) pH (1996) DO (2006)	Loss of resources has delayed the development of this TMDL	Grazing Recreation	Proposed: Identify and prioritize nutrient sources and implement appropriate BMPs.	Lake operated by Corps of Engineers. Monitoring by USFWS will provide data to support TMDL.
A	Alvord Park Lake	Ammonia (2004)	Data collection complete TMDL development ongoing	Urban, duck feeding, unknown Source of water?	Proposed: Identify and prioritize sources and implement appropriate BMPs. *E. coli* impairments may be dropped due to the use of the wrong standard in the original listings.	City of Phoenix Parks Department
A	Apache Lake Canyon Lake Salt River just below Saguaro Lake	Dissolved oxygen (2004) (Added Apache in draft 2006)	Loss of resources has delayed the development of this TMDL	Wildfire Grazing Forestry Roads Small town urban sources	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: Trees for the Rim (after wildfire)	USFS and Friends of the Forests
A	Bear Canyon Lake	pH (2004 by EPA)	Imitated in 2007.	Unknown (recreation, grazing?)	Proposed: Identify and prioritize sources and implement appropriate BMPs. May de-list based on natural conditions.	US Forest Service MOU
A	Bill Williams River (from Alamo Lake to Castaneda Wash)	Ammonia (2006) pH (2006), DO (2006)	Loss of resources has delayed the development of this TMDL	See source discussion For Alamo Lake nutrient impairments	Proposed: Identify and prioritize nutrient sources and implement appropriate BMPs.	See discussion for Alamo Lake nutrient impairments

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Chaparral Lake	DO (2004) *E. coli* (2004)- *E. coli* to be delisted in 2010	To initiate in 2008-09	Urban lake. If connected to Indian Bend Wash, it receives urban drainage during storms from an area of Scottsdale.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	City of Scottsdale Parks Dept
A	Colorado River (from Hoover Dam to Lake Mohave)	Selenium (2004)	Loss of resources Has delayed the development of this TMDL	Natural springs and out of state sources most likely	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states (how to remediate these?). Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	
A	Colorado River (from Lake Powell to Paria River)	Selenium (2006) Suspended sediment concentration (2004 by EPA)	Loss of resources has delayed the development of this TMDL	Same as Colorado reach above.	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states (how to remediate these?). Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	Same as Colorado reach below.
A	Colorado River (from Main Canal to Mexico)	Selenium (2006) DO (2006)	Loss of resources Has delayed the development of this TMDL	Agriculture (crop production), WWTP discharges, septic systems, out-of-state loads	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states (how to remediate these?). Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	California's Colorado River Basin Board has also listed this portion of the river as impaired due to selenium.

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Colorado River (from Parashant Canyon to Diamond Creek)	Selenium (2004) Suspended sediment concentration (2004)	Loss of resources has delayed the development of this TMDL	Natural sandstone formations (SSC) Natural springs (Se) Grazing (SSC) Recreation (SSC) Out of state sources (Se)	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states (how remediate these?). Selenium from ag return flows is a point source, but these flows are exempt from permit requirements. WQIGs: 1. Kaibab Moccasin Wash range and crop BMPs (1997) 2. Fredonia riparian improvement 3. Milkweed riparian restoration (Hualapai) (2000) 4. Mohawk Canyon (Hualapai) 2005. Red springs fencing (Hualapai) 1998 6. Bank stabilization at Spencer Beach (2007) 7. Road Stabilization at Diamond Creek (2008)	Colorado River Salinity Program (B of R); Lower Colorado River Basin Compact (with other states)
A	Coors Lake	Mercury in fish (EPA listed in 2004)		Mining	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	
A	Cortez Park Lake	DO (2004) High pH (2004)	Data collection complete TMDL development ongoing	Urban lake. Duck feeding. Source of water?	Proposed: Identify and prioritize sources and implement appropriate BMPs.	City of Phoenix Parks Department
A	Crescent Lake	pH (2002 - EPA)	TMDL to be initiated in 2009	Grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs. Possible de-list.	Friends of the Forest

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	East Verde River (from American Gulch to Verde River)	Arsenic (2006) Boron (2006)	To initiate in 2007	Probably natural. Concentration increase when water is not being transferred into this river from East Clear Creek. WWTP discharges in Payson?	Proposed: Identify and prioritize sources and implement appropriate BMPs. . Recent data shows no exceedances.	Verde Watershed Association
A	East Verde River (from Ellison Creek to American Gulch)	Selenium (2004)	To initiate in 2010	Unknown. May be natural	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Verde Watershed Association
A	Gila River (from Centennial Wash to Gillespie Dam)	Boron (2004) Selenium (2004) (Although Boron was not listed in 2002, it was on the 303(d) List most of the time since 1990)	Loss of resources has delayed the development of this TMDL	Wastewater discharges Agricultural crop production, including canal return flows Natural sources	Proposed: Identify and prioritize sources and implement appropriate BMPs. Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	Corps of Engineers
A	Gila River (from Coyote Wash to Fortuna Wash)	Boron (2004 relist) Selenium (2004)	Loss of resources has delayed the development of this TMDL		Proposed: Identify and prioritize sources and implement appropriate BMPs. Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	
A	Gila River (from Mineral Creek to San Pedro R)	Sediment (2006)	Loss of resources has delayed the development of this TMDL	Wildfire Grazing Forestry Roads Small town urban sources	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: Trees for the Rim	

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Little Colorado (from Porter Tank to McDonalds Wash)	Copper (1992)- delist Silver (1992)- delist Suspended sediment concentration (2004 EPA, 2006 ADEQ)	Initiated in 2007- TMDL report being drafted	Unknown (metals) Grazing, roads, recreation, other (SSC)	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Little Colorado River Watershed Coordinating Council
A	Little Colorado (from Silver Creek Wash)	Sediment (EPA 2004) *E. coli* (2004)	Initiated in 2007- TMDL reports being drafted	Grazing, small urban areas.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: Silver Creek sediment reduction (1994)	Silver Creek Advisory Commission and the Show Low Creek Partnership, Little Colorado River Watershed Coordinating Council)
A	Long Lake (lower)	Mercury in fish (2004 by EPA)	TMDL submitted to EPA 8/10	Air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	Little Colorado River Watershed Coordinating Council
A	Lyman Lake/ Reservoir	Mercury in fish (2004 by EPA)	Currently monitoring	Air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate BMPs.	Little Colorado River Watershed Coordinating Council
A	Mule Gulch and tributaries, including Brewery headwaters to Highway 80 bridge (3 reaches)	Copper (1990) Zinc (2004 portion) Cadmium (2004 portion) pH (2004 EPA portion)	Developing site specific standard	Current and historic mining	Proposed: Identify and prioritize sources and implement appropriate BMPs. Completed: FMI has re-routed stormwater and seeps to minimize impacts to Mule Gulch ADEQ is working on a site-specific copper standard	

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Painted Rocks Borrow Pit Lake	DO (1992)	Will initiate when lake refills.	Urban, agriculture, grazing, roads, construction. Prior diagnostic feasibility study indicated problem is primarily due to lake management and flow.	Proposed: (based on diagnostic feasibility study in 1990's) Operate lake in a manner that increases DO levels (e.g. higher levels). Low priority--borrow pit only fills during flood events.	
A	Paria River (from Utah border to Colorado River)	Suspended sediment concentration (2004) *E. coli* (2006)	Loss of resources has delayed the development of this TMDL	Natural sandstone formations (SSC) Natural springs (Se) Grazing (SSC) Recreation (SSC) Out of state sources (Se and SSC) Potentially area may provide data for natural background conditions	Proposed: Identify and prioritize sources And implement appropriate BMPs. Identify source loads contributed from other states (how to remediate these?) Exceedances possibly primarily due to natural conditions (sandstone)	National Parks Service MOU
A	Parker Canyon Lake	Mercury in fish (2004 by EPA)	TMDL report is being drafted	Air deposition. Investigating watershed to determine if any mining sources exist.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	
A	Pinto Creek (from headwaters to Roosevelt Lake)	Copper (1990)	Phase 1 completed in 2001. Phase II under development. TMDL waiting for a site-specific copper standard.	Historic and current mining	TMDL indicated sources: 1. Mining, especially at Gibson Mine. 2. Survey area to identify other abandoned mining operations and prioritize for remediation. WQIG: 1. Gibson Mine remediation (2006) 2. NPS Reduction of Copper to Pinto Creek (2010) ADEQ is attempting to set a site specific copper standard	Friends of Pinto Creek

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Pinto Creek (from unnamed tributary to Roosevelt Lake)	Selenium (2004) (expanded area in draft 2006)	To initiate in 2008	Historic and current mining.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Friends of Pinto Creek
A	Queen Creek (from headwaters to Potts Canyon)	Copper (2002)	Model update to include recent data collected, site specific standard will likely not be developed	Historic and current mining.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Arizona Parks Dept. friends of Boyce Thompson Arboretum.
A	Rose Canyon Lake	Low pH (2004 by EPA).		Unknown. May be naturally low pH values.	Proposed: Identify, prioritize and implement appropriate nutrient BMPs.	
A	Salt River (from Pinal Creek to Roosevelt Dam)	Sediment (2006)	To initiate in 2010	Grazing, forestry, roads stream bank and channel destabilized. Wildfires. Mining.	Proposed: Identify and prioritize sources and implement appropriate BMPs. **May** be de-listed in 2010 Assessment Report. WQIG: Trees for the rim (wildfire)	USFS MOU Friends of the Forest

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Salt River below 23rd Ave WWTP Gila River (from Salt River to Painted Rocks Reservoir) (8 reaches) Hassayampa River (from Buckeye Canal to Gila River Painted Rocks Reservoir Painted Rock Borrow Pit Lake)	DDT, toxaphene, and chlordane in fish tissue (EPA listing 2002) (ADEQ had this listing from 1992 to 2002)	Loss of resources has delayed the development of this TMDL	Historically used pesticides. Residual pesticides are likely being contributed from areas where the pesticides were sprayed historically. Some concern that banned pesticides may have been dumped or improperly buried.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	
A	San Pedro River (from Aravaipa Creek to Gila River)	*E. coli* (2004) Selenium (2004)	Initiated in 2006. Draft TMDL being developed. Currently monitoring.	Grazing Mining Stream bank and channel destabilization	Proposed: Identify and prioritize sources and implement appropriate BMPs. WIP being developed for the middle San Pedro (2010) will likely be able to be used as a guide for identifying sources in this reach. ASARCO land swap taking place to mitigate loss of other riparian corridors may help. WQIGs: 1. Arivaipa Canyon riparian restoration (2000) 2. San Pedro riparian improvements (2000) 3. Wildlife habitat restoration (2003) 4. San Pedro cleanup trash (2003) 5. 3 Links Farm riparian restoration (2005) 6. Sediment control identification in The Narrows (2000) 7. Manzanita Erosion control (2006)	

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
A	Santa Maria River (from Little Sycamore Creek to Little Shipp Wash and from Bridle Creek to Date Creek) (2 reaches)	Mercury (2006)	Loss of resources has delayed the development of this TMDL	Historic mining	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	
A	Soldiers Lake and Soldiers Lake Annex	Mercury in fish (2004 by EPA)	TMDL report submitted to EPA 8/10	Air deposition	Proposed: Identify and prioritize mercury Sources and implement appropriate remediation.	Little Colorado River Watershed Coordinating Council
A	Sonoita Creek (from 750 feet below Patagonia WWTP discharge to Santa Cruz River)	Zinc (2004) Low DO (1998)	Initiated in 2006. ADEQ to extend EDW, which would eliminate the DO impairment	Mining in the watershed or wastewater discharges.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: 1. Audubon septic system improvements (2002) 2. Cattle exclosure at Audubon (2002) 3. C6 Ranch grazing BMPs (2002) 4. Redrock grazing improvements (2006)	Friends of Sonoita Creek and Friends of Santa Cruz
A	Upper Lake Mary and Lower Lake Mary	Mercury in fish (2002 by EPA)	TMDL report submitted to EPA 8/10	Primarily air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	US Forest Service MOU City of Flagstaff
A	Virgin River (from Beaver Dam Wash to Bend Wash)	Selenium (2004) Suspended sediment concentration (2004)	Loss of resources has delayed the development of this TMDL	Natural sandstone formations (SSC) Natural springs (Se) Grazing (SSC) Out of state sources (Se and SSC)	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states (how to remediate these?). ADEQ has very little data on this reach.	

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
B	French Gulch (from headwaters to Hassayampa River)	Copper (1994) Zinc (1994) Cadmium (1994)	Completed in 2004	Mining (primarily Zonia Mine)	Identified in TMDL (still proposed): Remediate mining issues at Zonia Mine Identify, prioritize, and implement appropriate BMPs at other mines.	
B	Gila River (from Bonita Creek to Yuma Wash)	*E coli* (2004) Suspended sediment concentration (2004 by EPA)	Initiated in 2006. Draft TMDL complete, under internal review	Grazing, roads, mining, recreation	Proposed: Identify and prioritize sources and implement appropriate BMPs. Selenium from ag return flows is a point source, but these flows are exempt from permit requirements. WQIGs: Gila River clean up (2006)	Upper Gila Watershed Partnership
B	Gila River (from New Mexico to Bitter Creek)	*E. coli* (draft 2006) Suspended sediment concentration (2006)	Initiated in 2006-Draft TMDL complete, under internal review	Grazing, agriculture crop production, septic systems	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIG: 1. Duncan Valley canal replacement (2007) 2. Gila Watershed Stewards Ph. I (2008) 3. Gila Watershed Stewards Ph. II (2010)	Upper Gila Watershed Partnership
B	Granite Creek (from headwaters Creek) Watson Lake (on Granite Creek) Targeted Watershed FY2009	DO (2004 - EPA – Granite Creek) Low DO (EPA 2004) Nitrogen (EPA 2004) High pH (EPA 2004)	Initiated Watson Lake TMDL in 2007. Investigation includes Granite Creek and its tributaries. Monitoring has revealed *E. coli* bacteria problems.	Urban, old city infrastructure, hobby farms, recycled wastewater, inadequate facilities for day workers, etc	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: 1. Retention basin improvement and street sewer education program (2007) 2. Granite Creek channel re-contouring in Watson Woods 3. Granite Creek riparian improvement in Watson Woods 4. Granite Creek Watershed Improvement Plan (2009) Other work completed by watershed group: ambient monitoring to determine sources of nutrients and *E. coli* bacteria. Other monitoring is proposed.	Prescott Creeks

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
B	Harshaw Creek (from headwaters to Sonoita Creek)	Copper (1988) Low pH (1988)	TMDL completed in 2003	Mine tailings	TMDL sources identified: Remediate mining area by: removing or filling over mining residue; redirecting runoff away from mining deposits; removing mine wastes in the stream bed or combine with neutralizing materials; and constructing wetlands to treat mine discharges.	Friends of Sonoita Creek and Friends of Santa Cruz
B	Hassayampa River (from headwaters to Copper Creek, including tributaries such as Cash Mine Creek)	Cadmium (1992) Copper (1992) Zinc (1992) Low pH (2006)	TMDL completed in 2002	Mines in the upper Hassayampa River area, including, but not limited to McCleur Mine, Senator Mine, Sheldon Mine, and Cash Mine.	Identified in TMDL and proposed: Remediate abandoned or inactive mine sites (McCleur Mine) contributing pollutants, including tailings and adits at these sites.	Prescott National Forest
B	Luna Lake	High pH (1998) DO (1998) Narrative nutrients (1998)	TMDL completed in 2000, including TIP	Grazing, septic systems, sporadic NPDES discharges, recycled nutrients in lake	Proposed: Eliminate nutrient discharges from Alpine Sanitary District (no current project identified) TMDL identified: Upgrade septic systems, grazing BMPs, urban BMPs, filter strips, riparian improvements, weed harvesting, dredging, and raise lake levels (reducing water diversions). WQIG: Luna Lake septic system upgrades (2001)	Upper Gila Watershed Partnership

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
B	Oak Creek (from headwaters to Spring Creek – 5 reaches) Spring Creek (from headwaters to Oak Creek) Targeted Watershed FY2009	*E. coli*(1994 – Slide Rock portion) (2006 draft - rest of Oak Creek and Spring Creek)	Phase I TMDL completed in 1999, with a TIP. Phase II TMDL submitted to EPA 8/10	Recreation, septic systems, urban runoff, grazing	ADEQ is currently evaluating effectiveness of these projects to help direct future projects. WQIGs: 1.Sediment traps - Guardian Project 2000. 2. Septic systems 2000-2002 3. Don't trash Slide Rock 4. Sediment catchments 00-02 5. Slide Rock education (1997) 6. DNA Genotyping (1999) 7. Septic systems (1998) 8. Outfall pipe (2000) 9. Septic survey (2001) 10. Trailhead toilets & riparian improvements (2002) 11. Redrock State Park constructed wetland (2006) 12. Oak Creek WQIG (2006) 13. Oak Creek Watershed Improvement Plan (2010)	Oak Creek Watershed (
B	Peck's Lake	High pH (1998) Low DO (1998)	TMDL Completed in 2001, including TIP	TMDL indicated sources primarily recycling of nutrients. Watershed is so tiny and not developed, so little would be contributed.	TMDL sources identified: Improve riparian conditions to remove sediments that might add more nutrient loads. . Lake is on private (Freeport) land; ADEQ has no current samples.	Northern Arizona Audubon Society Verde Watershed Association

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
B	San Francisco (from Blue River to Limestone Gulch) and Blue River (from Strayhorse Creek to San Francisco River) (Targeted Watershed FY2009)	*E. coli* (2006)	On hold due to WQIG/WIP development.	Grazing, recreation, urban runoff, septic systems. Upper Gila Watershed Partnership and Greenlee County Health Department believes the problem is human recreation without proper facilities.	Riparian improvements, fencing, and alternative water sources for cattle have been funded piecemeal throughout the watershed. Proposed: Identify and prioritize sources and implement appropriate BMPs (being done under WIP--see #4 below). WQIGs: 1. Martinez Ranch riparian Improvement and grazing BMPs 2. Kaler Ranch erosion control Phase I (2006) 3. Cole Creek and White Mule Creek sediment reduction (2004 4. San Francisco /Blue River WIP (2009) 5. Kaler Ranch erosion control Phase II (2010)	Upper Gila Watershed Partnership Greenlee County Health Department
B	San Pedro River (from Babocomari Creek to Dragoon Wash) Targeted Watershed FY2010	*E. coli* (2004)	Initiated in 2006. TMDL currently on hold due to WQIG/ WIP development.	Grazing Septic systems and urban runoff in Fairbank and Benson area	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: 1. San Pedro urban sediment reduction (Sierra Vista, 1995) 2. San Pedro sediment reduction (1997) 3. Borderlands upland improvements (2002) 4. Fort Huachuca road closure and crossing improve (2002) 5. San Pedro WIP (2010)	
B	Santa Cruz River (from Mexico to Nogales WWTP)	*E. coli* (2002)	Initiated in 2007- TMDL on hold due to loss of staff	Grazing, unknown sources in Mexico.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIG funds could be used to address grazing issues. . EPA national Targeted Watershed in 2008; Sonoran Institute awarded $858,612 to identify pollutant sources, develop a plan of action, and implement education and on-the-ground strategies. WQIGs: 1. Santa Fe Ranch riparian area improvement (2000) 2. Riparian improvement and monitoring (2003) 3. Santa Cruz River sediment control (2006)	Friends of Santa Cruz

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
B	Three R Canyon (from headwaters Creek and tributaries (Cox Canyon)	Beryllium (1994) Cadmium (1994) Copper (1994) Zinc (1994) Low pH (1994)	TMDL completed in 2003	Extensive mining in this small drainage, which includes unnamed tributary and Cox Gulch.	TMDL sources identified: Remediate mining area by: removing or filling over mining residue; redirecting runoff away from mining deposits; removing mine wastes in the stream bed or combine withneutralizing materials; and constructing wetlands to treat mine discharges.	Friends of Sonoita Creek and Friends of Santa Cruz
B	Tonto Creek (from headwaters tributary) and Christopher Creek (from headwaters to Tonto Creek Targeted Watershed FY2010	*E. coli* (1998) Phosphorus (relist 2006) Low DO (EPA 2004) Nitrogen (1998)	TMDLs for nitrogen and *E. coli* were completed in 2005	Grazing. Fish hatchery Inadequate septic systems for campgrounds and subdivisions.	TMDL identified sources: Inadequate septic tanks and recreational sources. WQIGs: 1. Gila County septic system upgrades (2006) 2. R-Bar-C Boy Scout septic improvements (2007) 3. Tonto Baptist Camp septic upgrade (2008) 4. Tonto Watershed Improvement Grant (2010)	Tonto Watershed Improvement Group
C	Arivaca Lake	Mercury in fish (1992)	TMDL completed in 1999, included TIP.	TMDL identified primary sources as air deposition and natural deposition from local substrates.	TMDL sources identified: Manage lake to reduce production of methylmercury. Possibly dredge lake sediments	Friends of the Forest
C	Boulder Creek (from Butte Creek to Copper Creek)	Arsenic (before 1998)	See comment below.	Mining	See comment below.	
C	Boulder Creek (from Wilder Creek to Butte Creek)	Be, Mn, pH, As, Cu, Zn (before 1998)	Completed TMDL in 2004 Completed TIP in 2005	Mining	TMDL identified sources: Remediation at Hillside Mine. Remediate planned but not implemented. Identify and prioritize other mining contributions in the drainage. ADEQ coordinating with Hillside land owners and Freeport McMoRan to facilitate a feasibility study (potentially carried out under a Freeport SEP).	

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
C	Mineral Creek (from Devils Canyon to Gila River)	Selenium (2004) Copper (1992) Low DO (2006)	Consent decree requires mine to meet all surface water standards; therefore, TMDL has not been initiated.	Mining (Ray Mine and Gibson Mine)	ASARCO is looking at ways to mitigate selenium contamination and low dissolved oxygen occurring in mining tunnel constructed to direct surface water around mining operation. (Existing consent decree). ASARCO has mitigated manganese and the majority of copper pollutants WQIG - Gibson Mine Mineral Creek side – remediation at Gibson Mine may mitigate remaining Cu contamination here, because exceedances were only during heavy storm flows.	
C	Rainbow Lake	Narrative nutrient (weeds) (1992) High pH (1992)	Completed TMDL and TIP in 2000	Primarily nutrient recycling. Implementing many BMPs and sewered area around lake to mitigate nutrients. May be grazing or urban runoff issues upstream.	Proposed: Identify and prioritize sources not identified in the TMDL and prioritize implementation. WQIG funds can't be used for in-lake treatments until all watershed contributions are addressed. ADEQ conducted preliminary monitoring to determine if dredging would be effective. Local community has decided to pursue alternative funds to apply herbicides or other in-lake treatments. Watershed group is moving forward with herbicide application (Fall 2010). Completed: Sewering of area. WQIGs: Rainbow Lake Water Quality Improvement Project (2008) –installing buffer strips around lake.	Little Colorado River Watershed Coordinating Council and Show Low Watershed Enhancement Partnership
D	Alum Gulch (from l to end of intermittent flow and tributaries (Humbolt Canyon)	Cadmium (1996) Copper (1996) Zinc (1996) Low pH (1996)	TMDL completed in 2003	Mine tailings and adit	TMDL sources identified: Remediate mining sources. USFS has remediated Worlds Fair and Humboldt Canyon mines (Worlds Fair mine adit not addressed).	Friends of Sonoita Creek and Friends of Santa Cruz
D	Cave Creek (from headwaters to South Fork of Cave Creek)	Selenium (2004)	Initiated in 2006. New monitoring shows no exceedances.	Unknown. This is a pristine area.		Upper Gila Watershed Partnership

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
D	Lakeside Lake	Nitrogen (2004 EPA) Phosphorus (2004 EPA) Chlorophyll (2004 EPA), DO (2004) NH3 (2004)	TMDL completed in 2005	This lake formerly but no longer receives effluent. Wildlife, duck feeding, dog droppings may contribute some nutrients.	TMDL identified: Further treatment of effluent (tertiary or constructed wetland); provide more well water (not effluent); reduce storm water entering lake, dredge lake to remove nutrients in sediment; upgrade aeration system in lake; use alum to remove phosphorus from water column; use algaecides; and drop lake level in spring to minimize algae growth WQIGs: Treating lake with Alum to remove phosphorus New permit indicates that city will not be discharging effluent to the lake	City of Tucson Park and Recreation. Arizona Game and Fish Department
D	Little Colorado River (from West Fork LCR to Lyman Lake) (several reaches) Targeted Watershed FY2010	Sediment/turbidity (1992)	TMDL & TIP completed in 2002. Need to reevaluate using SSC standards; sampling for SSC & turbidity in 2009 & 2010	Grazing, recreation, silviculture (forestry), roads, smaller urban areas. Stream bank and channel degradation.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: 1. Coyote Creek sediment reduction (1998) 2. Big Ditch project (2000) 3. Coyote Creek Targeted Watershed Improvement Grant (2010)	US Forest Service MOU Little Colorado River Watershed Coordinating Council
D	Nutrioso Creek (from Nelson Reservoir to Little Colorado River)	Turbidity/sediment (1992)	Completed TMDL and TIP in 2002 Delisted upper portion (headwaters to Nelson Reservoir).	Grazing, forestry, roads stream bank and channel destabilized.	Proposed: Identify, prioritize, and implement sediment sources and implement appropriate BMPs WQIGs: 1. EC Bar Ranch grazing projects (2000-2007), 2. Rogers Ranch improvements (2000) 3. Murray-Saffel Canyon sediment controls (2001) 4. Greenwood sediment reduction (2003)	Little Colorado River Watershed Coordinating Council

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
D	Pena Blanca Lake	Mercury in fish	TMDL completed in 1999, included TIP.	Three sources identified in TMDL: 1) atmospheric deposition, 2) St. Patrick Mine ball mill site, 3) natural substrates.	TMDL identified: Remove tailings at St. Patrick Mine Ball Mill site and reduce sediment to lake. USFS has completed the remediation of St. Patrick mine. USFS dredged lake in 2009 to remove mercury recycling in lake sediments. Lake has been refilled and restocked, but it will take several years to determine fish tissue levels.	Friends of Santa Cruz
D	Stoneman Lake	Low DO (1998) High pH (1998) Narrative Nutrients	TMDL Completed in 2001, including TIP	TMDL indicated sources primarily recycling of nutrients. Septics maybe.	TMDL sources identified: Septics. Increase water sources for lake. Lake is ephemeral; low/fluctuating water levels make it difficult to meet standards. WQIGs: Replace septic systems, create grey water use systems, and construct sediment catchments.	Stoneman Lake Home Owners Association
D	Turkey Creek (from unnamed tributary to Poland Creek)	Copper (1992) Lead (2004)	TMDL completed in 2007. ADEQ is doing e monitoring.	Historic mining	US Forest Service has remediated tailings at Golden Belt and Golden Turkey mines. Doing effectiveness monitoring. MSGP should address sources from Blue Bell mine.	USFS plans to remediate the mine site believed to be contributing the majority of pollutants.
D	Verde River (from unnamed tributary to Railroad Draw) (from Sycamore Creek to Beaver Cr) and (from HUC boundary to Fossil Creek)	Turbidity/sediment (1994)	Completed TMDL in 2002, including TIP. Need to reevaluate. Monitoring SSC and turbidity to for effectiveness.	Grazing, urban development, roads, etc	ADEQ will evaluate the success of existing water quality improvement projects to determine what further projects needed. WQIGs: 1.Verde Riparian Project riparian area improvements (1990) 2. Yavapai Ranch riparian improvements (1994) 3. Hickey Irrigation riparian area project (1996) 4. West Clear Creek riparian improvements (2001) 5. Upper Verde restoration (2002) 6. Upper Verde wildlife area (2006) 7. Hart Prairie sediment control (2006) Recent data suggests potential for de-list due in part to WQIG-funded activities.	Verde Watershed Association

Mngmnt. Strategy	Surface Water	Pollutants (First Listed)	TMDL Development	Potential Sources	Improvement Activities/Comments	Support / Partnerships
E	Gila River (from Skully Creek to San Francisco River)	Selenium (2004)	Initiated in 2006	Crop production, grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs. Selenium from ag return flows is a point source, but these flows are exempt from permit requirements.	Upper Gila Watershed Partnership
E	San Pedro River (from Dragoon Wash to Tres Alamos Wash)	Nitrate (1990)	Site-specific Nitrate standard dropped in 2009.	Ongoing superfund site remediation at St. David (Apache Nitrogen Products)	Ongoing Superfund remediation and monitoring WQIGs: San Pedro River cleanup near St. David (2003)	Community Watershed Alliance (Middle San Pedro)
F	Nogales and East Nogales Wash (from Mexico to Portrero Wash)	*E. coli* (1988) Ammonia (2004) Chlorine (1988) Copper (2004)	Loss of resources has delayed the development of this TMDL	Infrastructure deterioration in Mexico, which allows raw sewage to flow into Arizona. Chlorine is added to reduce human health risks.	Infrastructure upgrades must be accomplished in Mexico.	Friends of the Santa Cruz

Appendix B: WQIG FY10 Funding Cycle RFGA Excerpt

(Note: The full RFGA and Appendices referenced therein can be found on the ADEQ Web site at: http://www.azdeq.gov/environ/water/watershed/download/cycle12.pdf)

Arizona Department of Environmental Quality
Water Quality Improvement Grant Program
RFGA for Grant Cycle 12, FY2010
ADEQ Contract EV10-0051

I. Funding Opportunity Description

A. Objective of Funding Opportunity Announcement

The Arizona Department of Environmental Quality (ADEQ) is requesting applications to fund projects that implement on-the-ground water quality improvements to reduce nonpoint source pollution, or encourage successful community-based approaches and management techniques to protect and restore watersheds with nonpoint source related impairments.

The objective of this Request for Grant Applications (RFGA) is to invite watershed partnerships, land owners, state agencies, local governments, universities, and other entities to leverage their money and resources on projects and activities that will quantifiably reduce nonpoint source pollution in Arizona water bodies. Projects funded will be selected through a competitive process. Priorities for funding are described in Section B, *Eligible Projects*.

B. Total Project Funding

Approximately $1.8 million is available for funding in the upcoming cycle. The distribution of these funds from the United States Environmental Protection Agency is provided pursuant to Section 319(h) of the Clean Water Act. ADEQ expects to make multiple awards to grantees. There is no restriction on the amount of funds that can be requested by or awarded to a single project, but all project costs must be commensurate with appropriate and measurable water quality benefits.

C. Program Description

C.1. Program Overview

The ADEQ Water Quality Improvement Grant (WQIG) Program allocates money from the United States Environmental Protection Agency (EPA) to interested parties for implementation of nonpoint source management and watershed protection. The distribution of grant funds from EPA is provided pursuant to Section 319(h) of the Clean Water Act and administered by the ADEQ Water Quality Division. ADEQ uses these federal funds to implement on-the-ground water quality improvement projects to control nonpoint source pollution.

Nonpoint source pollution is polluted runoff from many different sources and remains the nation's largest source of water quality problems. Nonpoint source pollution occurs when rainfall, snowmelt or irrigation runs over land or through the ground, picks up pollutants and deposits them into rivers, lakes and coastal waters or introduces them into ground water. Agriculture, forestry, grazing, septic systems, recreational boating, urban runoff, construction, physical changes to stream channels and habitat degradation are potential sources of nonpoint source pollution. Projects must focus on improving or protecting water quality within the state of Arizona.

Applicants are encouraged to review Arizona's 5-Year Nonpoint Source Management Plan by going to our Web site to become familiar with ADEQ's NPS program goals, objectives, and timeline. The Nonpoint Source Management Plan was developed by ADEQ and outlines the state's watershed management strategies to restore the designated uses to impaired water bodies.

ADEQ's 2006/2008 Status of Ambient Surface Water Quality in Arizona – Arizona's Integrated 305(b) Assessment and 303(d) Listing Report provides information about surface waters that are classified as "impaired" or "not attaining" and pollutants causing these impairments that may be useful in developing a grant proposal. This report and the status of TMDL development can be downloaded at ADEQ's Web site: www.azdeq.gov/environ/water.

Watershed plans have been developed by the Nonpoint Source Education for Municipal Officials (NEMO) for most of Arizona's 10 watershed planning areas. These plans provide information on water quality issues and mitigation methods that should be considered. The NEMO Web site also has an interactive mapping capability that might be useful in developing grant proposals. NEMO's Web site is: www.srnr.arizona.edu/nemo.

C.2. Project Funding Limitations
Requested grant funding cannot exceed 60 percent of the total project costs. At least 40 percent of the total project costs must be met using non-federal match.

Salaries, overhead, or indirect costs for administrative services provided and charged against activities and programs carried out with the grant shall not exceed 10 percent of the grant award. Any remaining administrative costs must be covered by matching funds.

C.3. Award Instrument
Water Quality Improvement Grants are awarded on a reimbursement basis. Reimbursements will be made to grantees pending the submission and approval of proper Request for Reimbursement forms and reporting documents as detailed in the final grant agreement.

C.4. Program Authority
ADEQ is offering this grant opportunity under the authority of A.R.S. Title 41, Chapter 24.

D. Grant Cycle Timeline
November 2009: Request for Grant Applications released
December 17th and 18th 2009: Workshops
January 19th, 2010 3:00pm: Pre-proposal deadline (mandatory).
March 5th 2010, 3:00pm: Final Application deadline
March –June 2010: ADEQ and EPA review and approval process
July 2010: Award Announcements

E. Funding Priorities
ADEQ is placing an emphasis on the implementation of activities identified through planning efforts in priority sub-watersheds where water quality and watershed planning activities have taken place. The goal is to encourage successful community-based approaches and management techniques to protect and restore Arizona's watersheds, ultimately bringing waters assessed as 'Impaired' back into attainment for water quality standards. Funding priorities are based on **both** the subwatershed and the indicated pollutant of concern.

Priority sub-watersheds and pollutants of concern for WQIG Cycle 12 are:

- **Little Colorado River Headwaters (from West Fork LCR to Lyman Lake). Impairment: Sediment/turbidity.**
- **Tonto Creek (from headwaters to unnamed tributary) and Christopher Creek (from headwaters to Tonto Creek. Impairments: E. coli, Phosphorus, Low DO, Nitrogen.**
- **San Pedro River (from Babocomari Creek to Dragoon Wash). Impairment: E. coli.**

Maps of these watersheds can be found in Appendix A.
Unless otherwise indicated, projects outside of these priority areas may be considered for funding IF they can demonstrate a high likelihood to quantifiably reduce nonpoint source

pollution in an impaired water body and/or IF they fulfill other nonpoint source education and reduction priorities for the State.

By entering into a grant agreement with the ADEQ Water Quality Improvement Grant Program, grantees must abide by the WQIG standard terms and conditions found in Appendix G. Additional "special conditions" may also be incorporated into individual grant agreements.

II. Eligibility Information

A. Eligible Applicants

All public and private entities as well as individuals may apply for WQIG funding. Past applicants have included individuals, tribal authorities, universities, government entities, environmental groups, and watershed partnerships. Interested applicants must submit a pre-proposal in order for their final application to be eligible for funding consideration. Pre-proposal requirements are included in Appendices B-D.

B. Eligible Projects

Three types of projects will be considered for funding. Each project type has different application requirements. Applicants must submit the correct application (noted below) for their particular type of project in order to be considered for funding.

B.1. Targeted Watershed Improvement Plan

Targeted Watershed Improvement Plan projects will result in the creation of a Watershed Improvement Plan (WIP) for a defined watershed or subwatershed, addressing a specific nonpoint source pollutant of concern. WIPs are needed to identify and prioritize water quality improvement projects critical to restore water quality. Projects should ideally focus on 10 or 12 digit HUCs, although slightly larger or smaller drainages may be feasible dependent upon the project. This grant will fund a two-year two-phased process to develop and implement targeted plans:

Phase I – Plan development (first year)
Phase II – Initial Plan Implementation (second year)

The development of these WIPs is strongly community-based and must include key personnel with technical expertise in planning, plan writing and development, monitoring, BMP engineering and implementation and other key areas within the key personnel of the grant. ADEQ will provide supplemental support throughout the development and implementation of these watershed improvement plans. To assist you in framing the scope of work for your proposal, applicants should review the following document, located on the ADEQ Web site: Watershed Improvement Plans, a Step-by-Step Technical Guide. **For more information about WIP projects including pre-proposal and application formats, see Appendix B.**

B.2. Watershed-scale NPS Management

Watershed-scale Nonpoint Source (WNPS) Management projects must be able to demonstrate a high likelihood of reducing nonpoint source pollution in a watershed with an impairment or demonstrated nonpoint source water quality issue. These projects are appropriate for situations where the applicant is proposing to utilize a watershed-based approach to identify critical pollutant loading sites where BMP implementation is needed. To be considered for WNPS funding, the application must demonstrate that a nonpoint source water quality issue has been documented in the area of concern, and that the pollutant(s) & probable source(s) as well as applicable BMPs have been identified. Applications for WNPS projects must include criteria that will be used to determine where applicable BMPs will be implemented and how they will be designed for maximum effectiveness. Due to the complexity associated with accurately identifying all of the relevant pollutant sources, WNPS projects are likely to be most effective when restricted to a 10 or 12-digit Hydrologic Unit Code (HUC) area with relatively homogeneous land use. **For more information about WNPS projects including pre-proposal and application formats, see Appendix C.**

B.3. Watershed-scale Education & Training

Watershed-scale Education & Training (WET) projects should be geared toward raising the level of public awareness and motivation to ready a group to participate in a future watershed-scale implementation project to reduce nonpoint source pollution. This classification would be geared towards watersheds where nonpoint source pollution water quality issues exist, but the community as a whole may not yet have a broad enough understanding or interest to participate in a WIP or WNPS project. WET project must include an on-the-ground implementation component. **For more information about WET projects including pre-proposal and application formats, see Appendix D.**

C. Eligibility Requirements for All Projects

C.1. General Requirements

Applicants shall adhere to Federal, state, and local laws, regulations, and codes, as applicable, and shall obtain all required approvals and permits. Applicants shall also coordinate and obtain approvals from all site owners and operators. Implementation projects must also include an education and outreach component; education projects must include an implementation component. Applications must be clear, complete, and follow the required format (see Appendices A-C).

C.2. Pre-proposal submittal

In order for a final application to be considered for funding, applicants must first submit a pre-proposal for review and comment. The pre-proposal allows for the applicant to receive early feedback on the strengths and weaknesses of their project, one on one consultation to discuss the proposal and the grant process, and technical assistance in the development of scientifically sound management practices to increase the success of the project. Upon review of the pre-proposal, ADEQ may request to arrange a site visit to better understand the proposed project. Formats for pre-proposal submission are included in the application packets found in Appendices A-C.

C.3. Nonpoint Source Pollution and Water Quality Improvement

In order to be considered for funding, all projects must focus on the reduction of nonpoint source pollution to an Arizona water body and must be able to demonstrate water quality improvements.

C.4. Smart Growth Scorecard Requirement

Applications submitted by counties or incorporated cities or towns must reference a Smart Growth Scorecard. The Smart Growth Scorecard is an incentive-based tool to help cities, towns and counties evaluate their growth planning efforts. Entities applying for grants and loans from participating state discretionary funding programs must reference a Scorecard.

It is only necessary to state in the grant application which Scorecard is applicable to fulfill the requirement. An applicant cannot reference an incomplete Scorecard. See below to determine how the Smart Growth Scorecard Requirement affects your eligibility:

If you are a community – counties and incorporated cities and towns:
Counties and incorporated cities and towns must complete and submit their own Scorecard as an eligibility requirement. ADEQ will take Scorecard ratings into account when evaluating applications. Applications from jurisdictions without a Smart Growth Scorecard in place will not be reviewed.

If you are a citizen, non-profit organization, special district, or other community group:
When citizens, non-profit organizations, special districts, and other community groups apply for state discretionary loans or grants, they need to reference the Smart Growth Scorecard of the community closest to their proposed project. If a project spans more than one jurisdiction, the applicant can choose the best score for their application.

If there is no Smart Growth Scorecard in place for any community relevant to the project, the application will still be reviewed, but will not be awarded any bonus evaluation points.

If you are a Tribal government or Tribal political subdivision:
Tribes and Tribal subdivisions may complete and submit their own Scorecard, use a Scorecard of the county they are located within, or use a nearby community's Scorecard.

If a project spans more than one jurisdiction, the applicant may choose the scorecard with the best rating to reference in their application. Applications are eligible to receive bonus points toward their evaluation score depending on the rating of the references Scorecard. The Scorecard status of all communities is available on the Arizona Department of Commerce Web site at the following location:
http://www.azcommerce.com/WebApps/Scorecard/PublicScoreCard.aspx

C.5. 40 percent Non-federal Match
Applicant must provide a 40percent non-federal match and clearly state all matching sources and amounts, with dates of funding receipt. Please use the following calculation to determine whether your application meets this requirement:

(Total project cost) X (0.6) = Maximum federal contribution
(Total project cost) - (Maximum federal contribution) = Required non-federal match

C.6. Length of Project/Activity
Projects should be executable within a two year time frame. If more than two years is necessary, the proposal must include justification.

D. Ineligible Projects
The following types of projects are ineligible for WQIGP funding:

- Projects that do not deal with reducing or eliminating a non-point source of pollution;
- Projects that deal with hook-up to sewer, improvements to sewers, waste water treatment facilities, or other permit-regulated facilities;
- Any task identified in a draft or final NPDES/AZPDES permit or SWPP
- Projects that do not include a measurement or evaluation of success in improving water quality
- Activities to maintain, repair, or replace components of past WQIG projects
- Projects that focus on water quantity issues
- Projects that do not follow the application guidelines as stipulated in the RFGA and its appendices

D.1. Consideration of Past Performance ADEQ reserves the right to disqualify applications based on past performance of the applicant or applicant's key personnel. Examples of past performance that may lead to disqualification may include, but not be limited to, defaulting on previous ADEQ contracts; non-compliance of contract requirements; and incomplete or late deliverables, etc.

III. Pre-Proposal and Final Application Information

A. Points of Contact
Requests for hard copies of this RFGA or any WQIG manual or materials can be directed to Bertha Thomas, Water Quality Division Planning Administrative Assistant, at BL1@azdeq.gov or (602) 771-4630.

Questions regarding eligibility, requirements, applications, or any other information about the WQIG program can be directed to Krista Osterberg, Grants & Outreach Coordinator at KO1@azdeq.gov or (602) 771-4635.

B. Date for Receipt of Pre-Proposals and Final Applications

Pre-proposals are a mandatory component of the application process. Pre-proposals must be received by the Grant Coordinator no later than 3:00pm on Tuesday, January 19th 2010. See table below for submittal instructions and requirements.

Final applications must be received by the Grant Coordinator no later than 3:00pm on Friday, March 5th 2010. See table below for submittal instructions and requirements.

C. Pre-Proposal and Final Application Submittal and Delivery Instructions

	Pre-proposal	**Final Application**
Due Date	ALL components of the pre-proposal must be received by **January 19th, 2010 at 3:00 pm**	ALL components of the final application must be received by **March 5th, 2010 at 3:00 pm**
Required Format	•1 hard-copy original •Electronic version (on CD only)	•1 hard-copy original plus 5 copies •Electronic version (on CD only)
Additional Submittal Requirements	•The original copy of the application must be clearly labeled "original" and must include the original ink signature of the Authorized Agent. •Include all copies, required schedules and attachments pertinent to your pre-proposal or grant application. Failure to include this information in the final grant application may result in the rejection of your application or may have a negative impact on the evaluation of the application. *ADEQ will not provide any reimbursement for the cost of developing or presenting applications.*	
Delivery Information	Grant applications packets must be delivered in a sealed envelope or package and labeled as follows: Water Quality Improvement Grant Application DEADLINE: *{Insert date and time here}* Arizona Department of Environmental Quality ATTN: Water Quality Division Grant Coordinator, #5160B 1110 West Washington Street Phoenix AZ 85007	

Include all required schedules and attachments pertinent to your pre-proposal or grant application. Failure to include requested information in the final grant application may result in the rejection of your application or may have a negative impact on the evaluation of the application. **Late Pre-proposals and Final Applications will not be reviewed.**

IV. Application Evaluation and Selection, Execution of Grant Agreements

A. Evaluation Process

The review and selection process begins after the grant application submittal deadline. During review, your application will be held confidential. Grant staff will first review your application to ensure that it is eligible for funding and all required components are present. ADEQ will notify applicants if the eligibility requirements are not met.

An evaluation committee will review all applications and make recommendations for funding. Grants that most closely meet the Program's priorities and are most likely to successfully achieve ADEQ's desired outcomes will be recommended. During the evaluation process, additional information may be requested and applicants may also be asked to revise their application based on the new information submitted.

Applications will be evaluated based on criteria specific to the type of project being applied for. Bonus points may also be awarded to applications based on criteria specified in the grant

application document. For more information about the selection criteria for each type of project, see Appendices B–D.

B. Project Selection

Projects are selected for award based on the scores determined by the evaluation committee. Awards are limited by the amount of funding available; therefore, all qualifying projects may not be funded.

Applicants will be notified as to whether or not they received a grant award after the evaluation process is completed. After evaluations are completed, all applications and the associated evaluations will be made available to the public upon request. If you believe that any of the information contained in your application should be held confidential, you must designate that information as "confidential" in your application and provide an explanation as to why it should be held confidential.

If an applicant does not receive a grant award, the applicant may request a meeting with the Water Quality Improvement Grant Program Manager to discuss the application and evaluation. Applicants also have the right to protest the award decision. A letter of protest should be written within 30 days from the date of notification receipt. Protest letters must be sent to the ADEQ Water Quality Division Director along with a copy to the Water Quality Improvement Grant Program Manager to the following address:

Arizona Department of Environmental Quality
Attention: Water Quality Division Director
1110 West Washington Street
Phoenix, Arizona 85007

The Water Quality Division Director will review the protest and the grant file and provide a written decision on the protest.

C. Execution of Grant Agreements

Once Special Conditions have been developed and agreed upon, ADEQ will issue two copies of the Grant Agreement to the applicant (now referred to as the grantee). The grantee must sign both copies of the Agreement and return them to the WQIG Program within 30 days of receipt. In signing the Grant Agreement, the grantee agrees to all Terms and Conditions as listed in Appendix C. The WQIG Program will execute the Grant Agreement and return an original to the grantee.

The grantee is required to do the following after they are notified of a grant award:

- Submit a Certificate of Insurance (Appendix E, clause 6.2).
- Set up a project file to maintain a record of all correspondence, receipts, invoices, and copies of all reports and documents associated with the project (Appendix C, clause *3.5*).
- Establish a separate bank account for the deposit of grant funds, carrying the name and number of this project
- Be aware of and comply with the *Disadvantaged Business Requirements* located at the end of Appendix C. If you will be using sub-contractors to perform work under a Grant Agreement, you must make an effort to recruit disadvantaged businesses, document those efforts, and report this information to ADEQ annually.

Please note: Work cannot be started on a project until both the Grant Agreement is executed and a Certificate of Insurance is submitted to ADEQ.

VI. Workshop Schedule

A. Workshop Dates and Locations

Webinar: WQIG staff will be hosting a web-based seminar, or webinar, to provide the public with information about the grant cycle. The webinar will be held on Thursday December 17th from 10:00 am to noon. To participate in the webinar, you must reserve a seat at one of the following locations:

- ADEQ Northern Regional Office (NRO)
  1801 W. Route 66, Suite 117
  Flagstaff, AZ 86001
  Map and directions
- ADEQ Southern Regional Office (SRO)
  400 W. Congress, Suite 433
  Tucson, AZ 85701
  Map and directions

Live Workshop: On Friday December 18th 2009, WQIG staff will host a grant workshop at the ADEQ Phoenix Office from 9:00 am to 3:00 pm. Highlights of this workshop will include:

- Targeting nonpoint source pollution using a watershed approach
- Detailed information regarding each of the three types of grants
- Key aspects of strong projects

Participants are encouraged to be prepared to discuss their own project ideas with the group.

B. Registration Information

B.1. Live Workshop Registration

To register for the December 18th Phoenix workshop, please contact Kym Holloway at (602) 771-4691, or by e-mail at holloway.kym@azdeq.gov. **Space is limited, and seats will be reserved on a first-come first-serve basis. Please RSVP by Friday, December 11th.**

B.2. Webinar Registration

To register for the December 17th webinar, please contact Kym Holloway at (602) 771-4691, or by e-mail at holloway.kym@azdeq.gov with your location of choice and number of seats needed. A limited number of log-ins will be provided for those who cannot travel to NRO or SRO but would still like to participate in the webinar. Please contact Kym for further details. **Space is limited, and seats will be reserved on a first-come first-serve basis. Please RSVP by Friday, December 11th.**

VII. Appendices

Appendix C: WQIG Projects Awarded During FY10

State Project # (EPA Grant #)	Project Title	Authorizing Agency	Water Body (Watershed)	Impaired/ Pollutant of Concern	Purpose	TMDL/WBP Support	Award Amount
EV09-0035							
11-T03	Oak Creek Watershed Improvement Plan Grant†	Oak Creek Canyon Watershed Improvement Group	Oak Creek	Yes/*E. coli*	To survey the watershed and develop a comprehensive Watershed Improvement Plan (WIP) to address NPS impairment issues. The WIP will identify and prioritize implementation projects in the watershed, as well as propose long-term plans and resources for watershed management.	ADEQ TMDL (1999, 2010)	$311,603.00
EV10-0051							
12-001	Septic Tank Closures for Program Year 9 of Lake Havasu City's Sewer Expansion Program	Lake Havasu City Public Works Dept.	Lake Havasu (15030101)	No/Nitrates	Decommissioning 3100 residential septic tanks at residences being hooked up to sewer. This project is part of a larger-scale 9-year plan to sewer Lake Havasu City to reduce nitrates in groundwater.	Lake Havasu City Phase I Wastewater Master Plan, 1998 Phase II Wastewater Master Plan	$550,000.00
12-002	Coyote Creek Watershed-scale Education and Training Grant†	Little Colorado RC&D	Coyote Creek/LCR Headwaters (1502000103)	Yes/Sediment	The grant money will be used to create a watershed improvement council, and to review existing and establish new best management practices in the Coyote Creek subwatershed. It also will develop site selection criteria for projects to reduce sediment and turbidity, foster community education and involvement, and develop volunteer water monitoring efforts.	ADEQ TMDL (2002)	$123,604.00
12-003	San Pedro River Watershed Implementation Plan†	Coronado RC&D, Inc.	San Pedro River from Babocomari Creek to Dragoon Wash (1505020207)	Yes/*E. coli*	To survey the watershed and develop a comprehensive Watershed Improvement Plan (WIP) to address NPS impairment issues. The WIP will identify and prioritize implementation projects in the watershed, as well as propose long-term plans and resources for watershed management.	NEMO WBP for the San Pedro Watershed, ADEQ TMDL in progress	$265,551.00

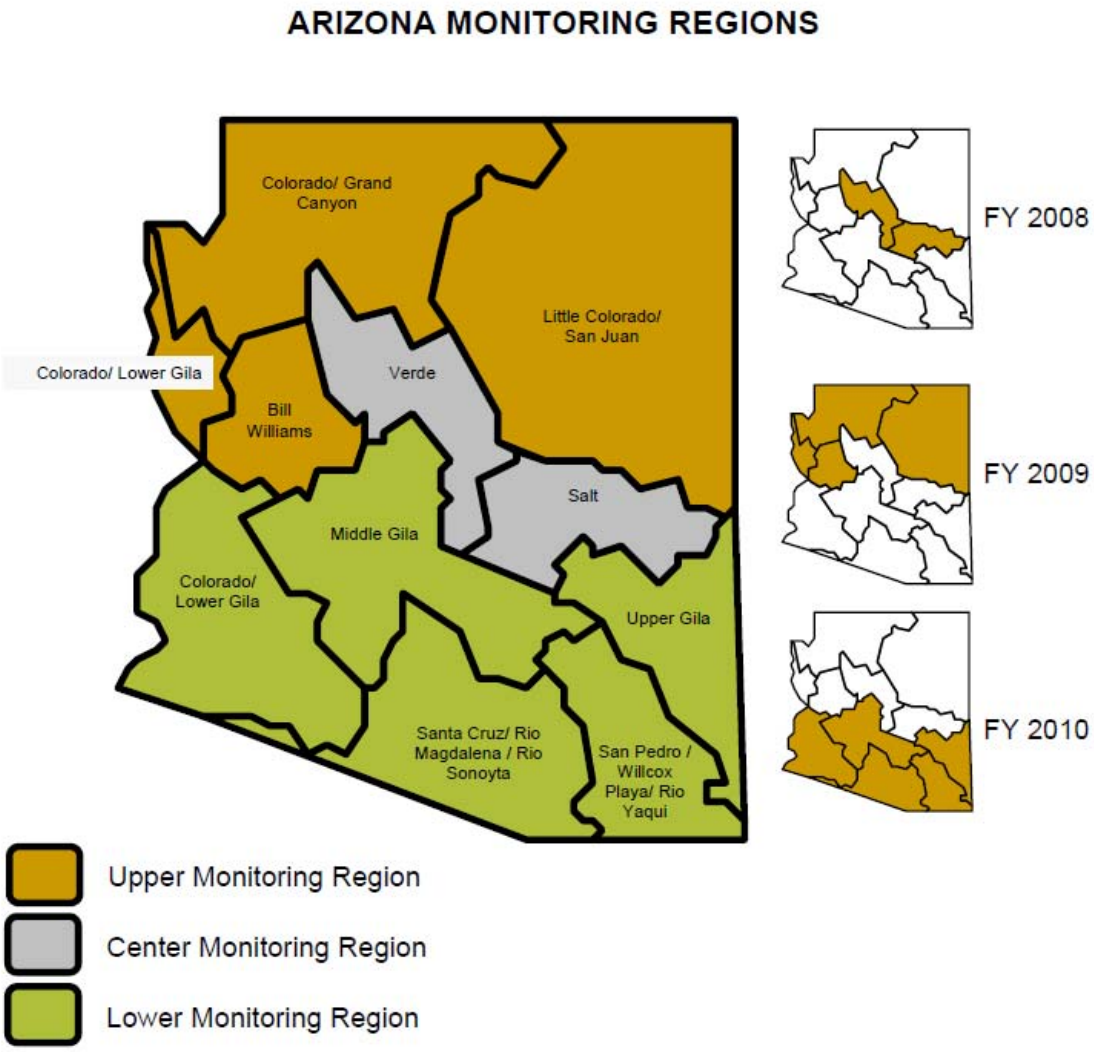
State Project # (EPA Grant #)	Project Title	Authorizing Agency	Water Body (Watershed)	Impaired/ Pollutant of Concern	Purpose	TMDL/WBP Support	Award Amount
12-004	Community Stewardship Model for Green Streets	Watershed Management Group	Santa Cruz River (15050301)	No/nitrogen, phosphorus, sediment (urban runoff)	The grant money will be used to increase awareness of storm water issues and develop best management practices to address problems and to build a corps of community volunteers provide stormwater BMP education and training to others living in the Barrio Kroeger Lane neighborhood, located east of the Santa Cruz River, and Barrio Centro, located in the Upper Tucson Arroyo watershed.	n/a	$163,396.20
12-005	*E. coli* Reduction on the San Francisco River through Alternative Livestock Water on Kaler Ranch Phase II†	Upper Gila Watershed Partnership	San Francisco River (1504000409)	Yes/*E. coli*	The grant money will be used to install the third of four wells to provide water for livestock owned by the Kaler Ranch. The Kaler family has agreed to remove the cattle year round from the riparian area once they have sufficient water from the alternative drinking water sources. The levels of *E. coli* in the river will be reduced as the grazing habits of cattle disperse in the surrounding land area, which is managed by the State Land Department, Bureau of Land Management and private sources.	NEMO WBP for the Upper Gila Watershed, ADEQ TMDL in progress	$100,246.00
12-006	The Upper Gila Watershed Steward Project, Phase II	Upper Gila Watershed Partnership	Gila River (15040002001)	Yes/Sediment	Phase 2 of the Upper Gila Watershed Project will offer four semesters of classes about monitoring and controlling sediment on the river, conducting field surveys, data searching, and developing data so that it can be used in future efforts directed toward receiving a targeted watershed grant to address sedimentation on the Gila River.	NEMO WBP for the Upper Gila Watershed, ADEQ TMDL in progress	$44,200.00
12-007	Tonto Watershed Improvement Group Watershed Education and Training Grant†	Tonto Watershed Improvement Group	Tonto Creek, Christopher Creek (150601050204)	Yes/*E. coli*, nutrients, low DO	Grant funds will be used to develop a community awareness and education program, focusing identifying nonpoint sources, basic monitoring training, and more in-depth identification of potential methods for dealing with the watershed's many old, undersized, and failing septic systems.	ADEQ TMDL (2004, 2005)	$70,791.33

State Project # (EPA Grant #)	Project Title	Authorizing Agency	Water Body (Watershed)	Impaired/ Pollutant of Concern	Purpose	TMDL/WBP Support	Award Amount
12-008	NPS Reduction of Copper to Pinto Creek	Franciscan Friars of California	Pinto Creek (1506010307)	Yes/Copper	Grant funds will be used to engineer and implement a soil cap at the abandoned Gibson Mine site, as well as to revegetate the area and engage nearby high school science programs to include information about nonpoint source and local mine mitigation activities in their curriculum. The cap will significantly reduce runoff of copper laden sediments from the abandoned mine site into Pinto Creek.	ADEQ TMDL (2001)	$595,370.25
EV11-008							
EV11-008	Arizona Water Festivals: Building on an Effective Education Model	University of Arizona	Statewide		Funding Project WET Water Festivals for fourth grade students to learn about watersheds and water quality, as well as expanding on this knowledge to teach sixth grade students to appreciate water quality by developing tangible attachments to Arizona's riparian areas. This will be done by engaging in water quality monitoring, wet-dry mapping, and exploration of riparian areas along the San Pedro River.	N/A	$29,262

State Project # (EPA Grant #)	Project Title	Authorizing Agency	Water Body (Watershed)	Impaired/ Pollutant of Concern	Purpose	TMDL/WBP Support
EV11-0009						
EV11-0009	Arizona Nonpoint Source Education for Municipal Officials (NEMO) †	University of Arizona	Work under this contract is restricted to ADEQ's Cycle 11 and Cycle 12 Targeted Watersheds	Supporting the Targeted Watersheds by providing: NEMO Internet Mapping Services (IMS) Workshops; web site upkeep; Automatic Geospatial Watershed Assessment Tool (AGWA) training; database management; educational outreach activities; mapping, modeling, and publication, and modeling support; load reduction modeling for nitrogen, sediment, and/or phosphorus; support for the 2012 Clean Watershed Needs Survey; and updates and/or improvements to the NEMO BMP Toolkit.	N/A	$334,183.00
EV11-0010						
EV11-0010	Master Watershed Stewards Program (MWS) †	University of Arizona	Work under this contract is restricted to ADEQ's Cycle 11 and Cycle 12 Targeted Watersheds	Provide support for the Targeted Watersheds by providing MWS courses focused on each respective watershed, in addition to a variety of watershed-specific short-courses on subject determined by the watershed stakeholders. The MWS program will also provide training and education to the watersheds, and will assist them in developing and determining the effectiveness of their own education and outreach materials.	N/A	$210,588.00

State Project # (EPA Grant #)	Project Title	Authorizing Agency	Water Body (Watershed)	Impaired/ Pollutant of Concern	Purpose	TMDL/WBP Support
EV11-0011						
EV11-0011	Technical & Analytical Support for *E.coli* Source Identification in Targeted Impaired Waters†	University of Arizona	Work under this contract is restricted to ADEQ's Cycle 11 and Cycle 12 Targeted Watersheds	Providing technical support to the Targeted Watersheds including classroom and in-the-field training on sampling and data analysis methods, assisting in sampling plan development, source identification for *E.coli* bacteria samples using DNA genotyping, and effectiveness monitoring.	N/A	$59,481
† Indicates projects addressing one of ADEQ's Targeted Watersheds					**Total Awarded: $2,858,275.78**	

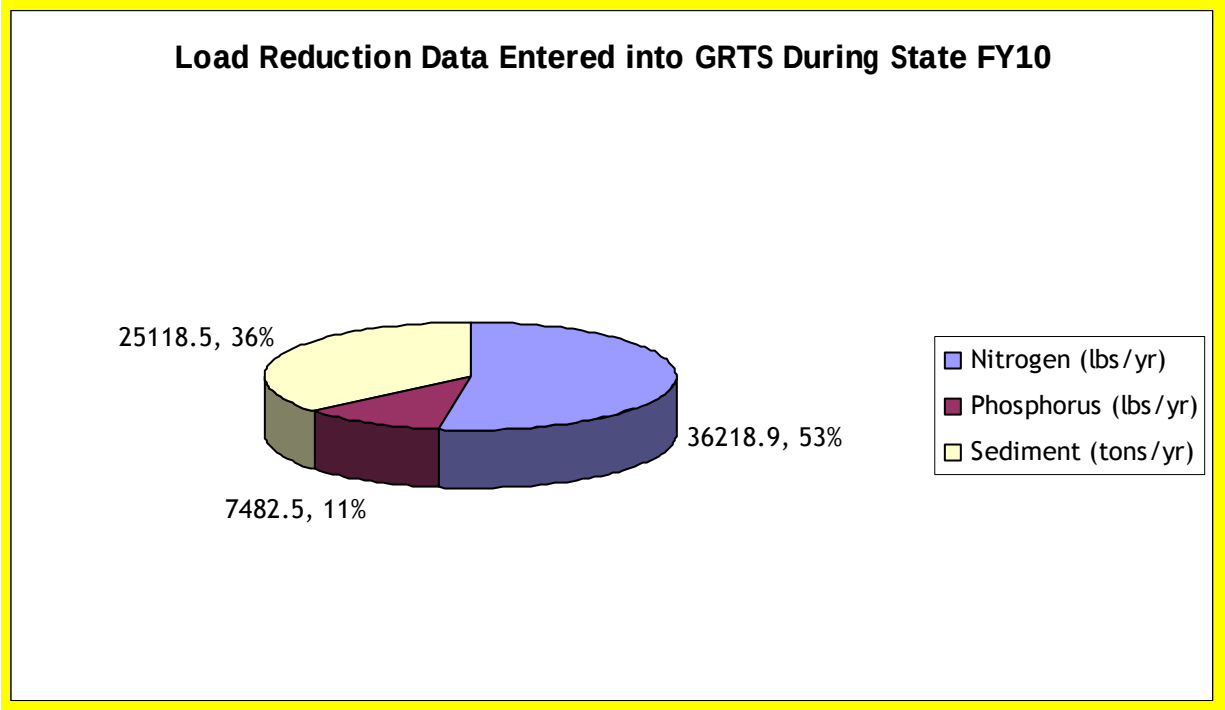
Appendix D: Arizona Monitoring Regions



Appendix E: Load Reductions

WQIG Load Reduction Calculations for Nitrogen, Phosphorus, and Sediment as Tracked in the EPA Grant Reporting and Tracking Database (GRTS)

Each project funded by the WQIG program to implement an on-the-ground water quality improvement project must describe a process for evaluating the effectiveness of the implementation efforts over time. Monitoring can include photographic tracking of project progress, vegetative transect data, and/or actual water quality monitoring data. Information on reductions in nitrogen, phosphorus, and sediment nonpoint source loads are tracked and reported in EPA's Grant Reporting and Tracking database (GRTS). GRTS enables EPA and states to demonstrate the accomplishments achieved with the use of 319(h) funding. The data entered into GRTS is used by the EPA to respond to inquiries received from Congressional committees, the White House, and various constituent groups.



Appendix F: Success Stories: Ash Creek and Gila Valley

Final Report & Success Story I:
Ash Creek Watershed Improvement Project
Submitted by: Henry Dahlberg, Mingus Springs Outdoor Learning Center

I. WATERBODY IMPROVED

Ash Creek and its tributaries were experiencing high sediment loads after significant rainfall. Sediment transport into Mingus Springs Pond increased turbidity to levels as high as 76 NTU. Low DO in the pond caused a major fish die-off (248 fish) in July, 2007.

II. PROBLEM

Ash Creek and its associated tributaries and pond are located on Mingus Mountain between Prescott Valley and Jerome. Ash Creek is a tributary of the Agua Fria River. Previous Water Protection and Water Quality Grants have improved the watershed by constructing livestock exclusion fences, improving drainage off the road and the completion of numerous small erosion control structures. However, significant sediment transport continued. Most sediment came from four larger sub-basins which feed Ash Creek. And the problem promised to get worse as the USFS planned for a major timber sale in those sub-basins and other tributaries feeding Ash Creek. The USFS has also done extensive prescribed burning in the watershed for the past eight years. This has resulted in increased runoff, overland flows and transport of debris, ash and sediment.

No TMDL was done. However, records of water quality at the pond go back many years. Those records, particularly turbidity records, showed degraded water quality for much of the year – particularly during summer monsoons. The just concluded Water Quality Grant focused on steps to reduce turbidity levels.

III. PROJECT HIGHLIGHTS

Two new sediment traps were constructed. One retains 80,000 gallons, the other 33,500 gallons. Each is at the bottom of sub-basins approximately 75 acres in size. Two existing traps were enlarged and now retain about 300,000 which represents about a 50 percent increase in size. The four sediment traps retain a total of 700,000 gallons and allow sediment to settle out before it percolates through the structure and continues downstream. Additional roadwork was completed during this project which added lead offs, water bars and drainage slope to the road with the goal of not allowing water to run down the road and pick up sediment which would then be carried into the stream. Two dozen more gabion erosion control structures were built making a total of 76 on Ash Creek. Many more are located on tributaries of Ash Creek. These small structures retain sediment, provide a seedbed for native grasses and often have a small water hole at the base of the structure. Thus, they provide feed and water for wildlife as well as retaining water in the watershed. All land disturbed by construction of the sediment traps and roadwork was seeded with native seed and mulched. A solar powered pond aeration system was installed at the pond in order to maintain sufficient DO levels for fish.
Projects were competed within the two years of the project funding. The Ash Creek Watershed Protection project works closely with the Upper Agua Fria Watershed Partnership (UAFWP). The UAFWP met at Mingus Springs in June of this year. Work will continue on the watershed for the foreseeable future.

IV. PROJECT EVALUATION

Dr. Mary Nichols, USDA ARS, and Henry Dahlberg completed (July 8, 2010) the second Total Station survey of the four main sediment traps. The Total Station surveys provide a three dimensional map which measures stage and volume. The sediment traps vary in retention capacity from 33,500 to 300,000 depending on the size of the sub-basin served. By repeating the survey, changes in volume can be determined which yields the amount of sediment deposition which has occurred since the previous survey. I have included the findings from the surveys completed in July, 2009. This year's findings should be very interesting because they will measure only sediment flows resulting from winter moisture. There was NO runoff from last year's monsoon. Dr. Nichols will not be able to calculate the new survey data until September. She is a volunteer and is employed by the ARS which takes precedent over our project. We look forward to being able to analyze the data from this year's surveys. My feeling is that due to the slow snow melt (we had no rains on snow pack) we had minimal sediment transport from winter moisture. Data is currently being collected annually as an in-kind contribution to the project and will continue far beyond the project's official end date.

We had one rain of .75 inches on the Sabaai Creek sub-basin on July 14, 2010. Because of extensive burning on that sub-basin in late fall of 2009, we experienced significant runoff. The sub-basin sediment trap retained 100,000 gallons of ash and debris-filled water. An investigation of the watershed showed moderate to extensive down-cutting throughout the burn area. Normally, we do not experience any runoff until the watershed has received 2.5 inches. Until that rain, we had only received .35 inches since June 1. Thus, we were able to measure the impact of burning late in a dry year. Portions of the watershed may be charitably described as moonscapes. How fortunate we are to have been able to put these sediment traps in place thanks to the support of the Water Quality Improvement Grant.

Since the survey was completed in early July, we have experienced heavy rains which caused all sediment traps to fill and sent varying amounts of water through the spillways. Our next survey will reveal how much sediment moved in the various sub-basins and because we have automated rain gauges on each of the sub-basins which record time and rainfall amounts we should be able to determine the relationship between rainfall, watershed condition and sediment transport.

All of the equipment has been purchased and installed. The main disappointment has been with the water level recorder. It is working well, but we have been unable to complete a Total Station survey of the entire pond. So while we are able to measure the amount of water level rise in a storm, we are not able to convert that data into cfs entering the pond from Ash Creek. We hope to have time in July, 2011 to complete the survey of the pond. The solar powered aeration pumps have managed to increase the DO in the pond to the point where no fish have been lost since it was installed.

Dr. Nichols and Mr. Dahlberg also did the first Total Station survey of the north end of the pond. This will serve as a baseline for further surveys in the coming years. They noted a small slug (approximately 2.25 cubic meters of sediment) where Ash Creek enters the pond which was deposited by winter moisture. They were not able to calculate the amount of snowfall this past winter because our automated rain gauges are not able to measure snowfall and we were unable to get into Mingus Springs for about three months. However, the top of Mingus Mountain recorded 156 inches of snowfall.

The timber sale scheduled for this year has been delayed due to a court challenge to the USFS NEPA by the Center for Biological Diversity and from concerns within the Forest Service about the robustness of the watershed and soils analyses. This delay is helpful because it gives us a few more years to establish baseline data before logging begins.

We have been very satisfied with the modifications to the road (undertaken as part of this project) which lies near Ash Creek and makes many crossings of the roadway. It experienced virtually no erosion and so contributed minimally to sediment transfer to the water course. We were able to reinforce some water bars and clean out leadoffs in June of this year.

V. RESULTS

The project will require several years in order to determine the amount of sediment which has been prevented from reaching the pond. But turbidity measurements indicate that water quality has improved. This year after heavy rains which filled the pond in three days the turbidity after one week was measured at 4.8 NTU. This compares with measurements over 50 NTUs in past years. There were no new ordinances or laws put into place as a result of this project.

VI. PARTNERS and FUNDING

Principal partners were USFWS – Partners for Wildlife, Yavapai College, UA Cooperative Extension, UA Climatology Department, USDA – ARS, USFS, Arizona Department of Forestry, Fann Contracting, Arizona Forest Products, Inc., Mingus Union HS – FFA, the AZGFD, and the Natural Resource Conservation Workshop for Arizona Youth (Society for Range Management.) Total grant was $32,289 and those funds supported the purchase of equipment for water testing, rainfall measurement, water level recorders, seed, GPS, GIS joint agreement with the USFS, solar power system and pumps for pond aeration system, materials for gabion erosion control structures, road improvements and construction and/or renovation of four sediment basins. In-kind matching funds totaled $29,232 and came from the above Partners as well as the Mingus Springs Camp and two hydrologists who donated all of their time to the project.

Photos:

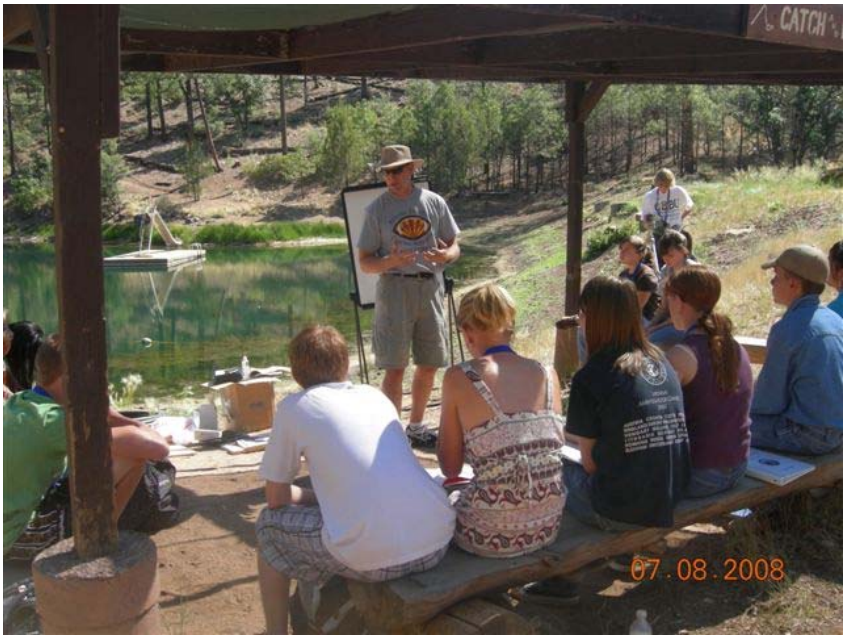
This photo shows the increased size of Sabaai sediment basin trap after renovation. The capacity is now 300,000 gallons.

Jasper Creek sediment basin before renovation.

Jasper sediment basin after construction. New holding capacity 300,000 gallons.

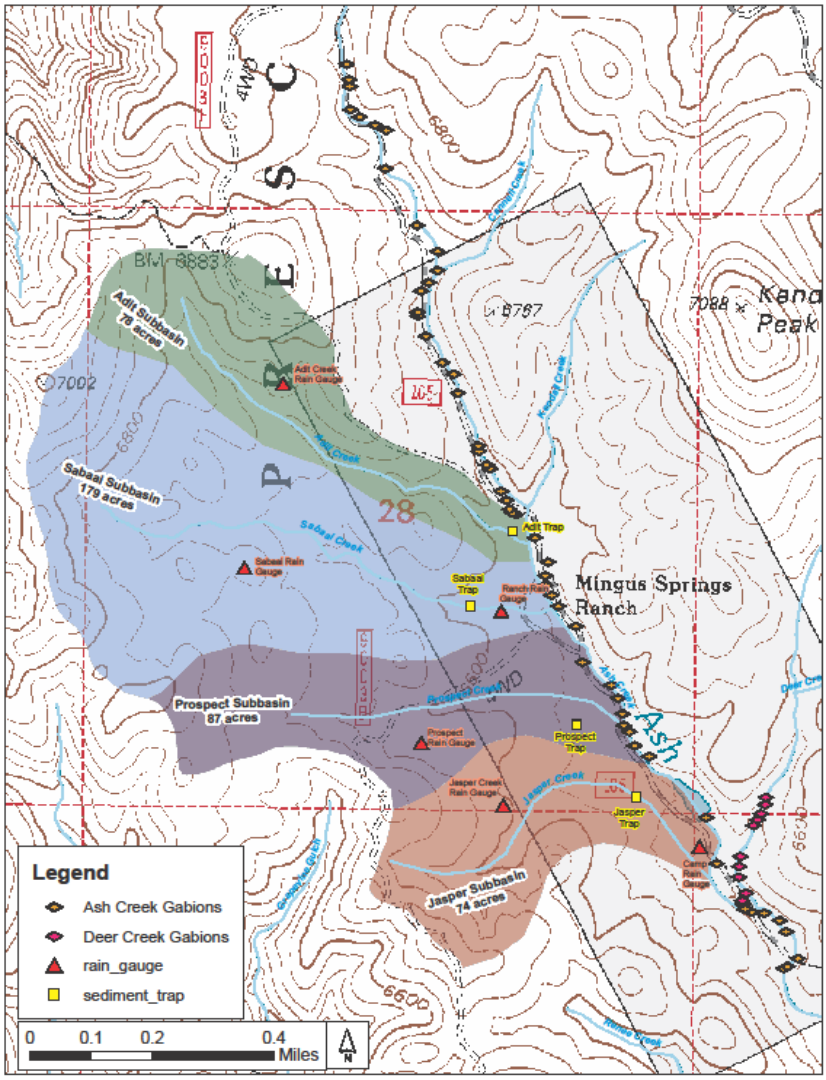
Photograph taken during the winter of 2010.

FFA students from Mingus Union High School constructing a one rock dam. "No kids, it is not just one rock!"



Over 1,000 students and adults study environmental education at Mingus Springs Outdoor Learning Center every year.

Map showing the locations of Gabions on Ash and Deer Creek. Also shown are the locations of sediment traps and rain gauges. Sub-basins are delineated with acreage noted.



Aspects of the project that worked well:

This was a successful project because many different agencies and individuals believed that the research would improve understanding of watershed dynamics in ponderosa forests. Everything necessary to understand the relationship between rainfall, slope, treatments and sediment flows is now in place. This data will be collected and analyzed in future years.

Aspects of the project that did not work well:

Sophisticated water chemistry equipment was not easy to use. Nor was the GPS unit recommended by the Forest Service. The GIS staff with the Prescott National Forest has been very helpful in teaching participants how to use the GPS and creating maps for the project.

Ideas on ways to improve aspects that did not work well:

Buy only equipment necessary to the task. For example, the Hach dissolved oxygen probe required one half hour of calibration each time it was used. I just did not have the time to do that, and so used the simpler but less accurate color comparator method.

Future activity recommendations for the watershed:

Now the fun begins! Everything is in place to do some significant research for many years to come. We encourage ADEQ Water Quality employees to continue to visit the project over the coming years. We will share data with you as it becomes available and would be delighted to share our experience with any applicant or grantee who envisions a similar project. Thank you so much for your help over the past two years. This has been an exciting and valuable project and has attracted interest from many groups, organizations and government entities.

Final Report & Success Story II:
Gila Valley Best Management Practices on Cropland
Submitted by: Ty Foster, Gila Valley Natural Resources Conservation District

I. WATERBODY IMPROVED

The goal of the Gila Valley BMP project was to help reduce and or eliminate contaminants in the irrigation runoff waters flowing back into the Gila River. The implantation of wattles and vegetation to slow and filter the water before it leaves cropland were the BMP chosen for this project.

II. PROBLEM

This project was proposed to address sediment loading, nutrient and pesticide runoff, and potential spreading of state listed noxious/invasive weeds into the Gila River through the installation of vegetative filter strips across the bottoms of irrigated fields. The picture above shows erosion and runoff caused by tail water from a farm in Gila Valley, Arizona.

III. PROJECT HIGHLIGHTS

By combining vegetative filter strips with nutrient management, pest management, crop rotation, and irrigation water management producers will also envelop Best Management Practices (BMPs) for furrow irrigated cropland into their management strategies. Graham County 4-H was asked to participate in this project to give children living in the community hands-on experience in improving their environment and the community while at the same time contributing valuable help with the project.

At the start of the project we initially identified Solar Barley to plant as the filter strip vegetation. However, after further research we needed to reconsider the plant type and make sure it fit certain specifications before we could use them.

The plant needed to be able to withstand heavy traffic (tractors), withstand water inundation for long periods of time, grow in the heat of the summer, and not have the potential to spread into the crop producing area of the field.

Arizona Cotton Top, Cane Bluestem, and Alkali Sacaton were considered as native species to plant for the filter strip along with Bermuda grass and Seco Barley. After talking with the NRCS and the Plant Material Center in Tucson, it was determined the native species may not be suitable for the trial at this

time. Tiffany (Teff) was identified as a potential species to use by the NRCS. While it is not a native to Arizona (Ethiopia), Teff is not cold tolerant. Frost will kill the plant and eliminate any ability for it to reproduce. So our time line of the grant was postponed until we were frost free.

The ideal situation for this project would have been to plant the seed and allow germination while the farmer pre-irrigated his fields (February thru March). With the delay in planting we missed the pre- irrigation rotation. So we installed a small water gate head in the main canal and ran a pipe under the road. This allowed us to irrigate and establish germination of the seed before another irrigation rotation came around. The pictures across and below show the preparation of the seed bed on the perimeter of the field, planting and irrigation.

Above right is a picture of filter strips being planted by volunteers at the bottoms of the irrigated fields, perpendicular to the furrows.

IV. PROJECT EVALUATION

Graham County 4-H Members were taught about water quality and the importance of conserving our natural resources. Through the 6 learning sessions, the kids were able to understand turbidity, non point source pollution and the effects it has on our community. Once the kids had an understanding of water quality I proposed the ADEQ project

to them to help educate and demonstrate to their community the importance of good resource practices. They installed waddles at the bottoms of the fields between irrigation sets (usually every 200' feet) to slow the flow of water allowing the seed to germinate and not be washed away.

The vegetative filter strips will act as a "brake" for the water, slowing it to allow sediment and plant parts and seeds to remain on the fields. The vegetative filter strip will also act as a sink, absorbing excess nutrients and pesticides.

Water samples were taken by Eddie Foster with the NRCS. We borrowed a turbidity meter from the Gila Valley Watershed to conduct analysis versus buying one. Trying to coordinate the kids schedule and irrigation timing was not possible to allow the kids to do the sampling. Eddie was on sight on the project from every aspect. I also called to several water testing sites to get prices to analyze the water samples for turbidity. They all told me it would be better to just use the turbidity meter.

V. RESULTS

Data Collected:

- Incoming Irrigation water measured 9NTU'S.
- Pre-filter strip establishment run off exceeded the turbidity meters ability to measure NTU's.
- Incoming irrigation throughout the year measured from 5 NTU's (pump water) to 110+ NTU'S (river water during monsoon season).
- Run off post filter strip establishment ranged from 22 NTU's to 200 NTU's.
- Filter Strip trapped an average of 1" of soil equaling roughly 52 tons.

I (Ty Foster, project manager) was able to show the children a sample of some tail water taken off another field. This sample allowed them to analyze visually for turbidity and feel the water and determine what debris they could recognize.

These pictures show the buffer strip seed bed complete and being irrigated for germination from the small head gate that was installed

Picture of final outcome of buffer strip at maturity coinciding with last irrigation with cotton.

We met our goal to keep the filter strips established until the last irrigation of the crop being grown.

VI. PARTNERS and FUNDING

- Graham County Cooperative Extension. (classroom instruction and teacher workshops of Water Quality)
- Graham County 4-H (Hands on learning for the local kids)
- 6 Adult Volunteers to help transport, chaperone kids
- Ron and JR Howard (Use of farm for project and time and equipment for installation)

Community Outreach

To reach out to our producers and the public we conducted 2 workshops for the producers and educated teachers, volunteers through various classroom and hands-on workshops. Class room instruction was given on curriculum developed and pre-curriculum. Also, we were able to take the 4-H members to state capital for them to talk about their water conservation project and how their community is important to them.

Ty Foster and Dusty Murdock from the Greenlee County Cooperative Extension conducted hands on classroom instruction for 70 4th graders at the Dorothy Stinson School. The lesson focused on non point pollution.

The kids were able to interact with "Wally the Wattle". Wally taught them about his purpose and how he can help conserve their Natural resources. Ty also built a diorama of the filter strip project to show kids the importance of runoff and how we as humans play a big role in how we treat our environment.

During the 2009 summer break, the local teachers had a summer in-service for expansion of education. I was asked to come and speak about water quality and give them some lesson ideas that they could take back to their classroom.

The lesson that I demonstrated was out of the Project Wet curriculum "Planet Zork". With this lesson the teachers pretended that they were stranded on Planet Zork and they needed to find a clean water source for survival. I displayed vials of different water substances and they had to test each one to determine the safest drinking water. In this lesson, I added a vile of dirty water and spoke about turbidity and explained the impacts it has to the environment. The teachers were very responsive and none knew about turbidity. Additional curriculum on water quality was handed out to the teachers.

Producer Workshops:
Two producer workshops were held in cooperation with the NRCS and Extension in which the filter strip trial was reviewed and discussed. The first workshop involved NRCS agronomists from the West Region Technical Center in Oregon. Both agronomists attending made a site visit to the filter strip and discussed its benefits, both on and off site with the district and producers. Also, cover crops were discussed as way to address non-point source water quality issues by increasing soil organic matter, infiltration rates, and soil water holding capacity.

The second workshop was held in March of this year to discuss irrigation water management as a part of a water quality and quantity BMP. In this workshop, producers learned how the identify soil moisture levels and irrigation system efficiencies. They also learned about methods of reducing runoff, and mitigation methods to eliminate the opportunity for nutrient and pesticide applications of leaving the field in tail water. Buffer strips, filter strips, and vegetative field borders were a large part of the mitigation discussed. The filter strip trial was used to show water quality improvements as well as accumulated soil that was trapped on the field and not allowed into the drainage system that leads back to the Gila River.

Educating on a Statewide Basis:

On Feb. 11th 2010 the Graham county 4-H accompanied our District Board to the State Capital to educate them on our local projects and Natural Resources. The kids handed out a flyer of the BMP project to some of our state Legislature and told them how important their generation is and how they are working to learn and improve water quality in their community.

Education Local Government:
I also was able to speak with the Graham County Board of Supervisor May 3, of this year on behalf of 4-H

and let them know the great projects and hard work the kids were doing. The board of supervisors was highly impressed with the water quality project and has been watching the effects. They hoped to see the kids and the District do more of these strips.

Aspects of the project that worked well:

1. Great cooperation and by in from the land owner.
2. The grade of the field made it hard to establish seed germination. The use of the wattles slowed the water enough to maintain soil integrity and allow for germination.
3. Installation of alternative irrigation source allowed water to be placed specifically on the filter strip to help with germination and establishment.
4. Because of the location of the project along HWY 70. Local farmers and community were able to observe project thru its completion.
5. 4-H members were able to participate in a Community Service Project in which they could watch their hard work grow and learn about Water Quality thru hands on.

Aspects of the project that did not work well:

1. Coordination irrigation schedules and kid's schedules to take water samples were not possible. Due to irrigation schedules determined by the Irrigation District.
2. Timing of planting of the Teff requirements of temp. For germination, we were not able to plant when the farmer was pre-irrigating. This would have been an ideal time to establish the filter strip. So an alternative head gate in canal was installed so we could get water anytime to establish seed bed.
3. The ground was furrow when it should have been corrugated. The fur roughs channeled the water to much. Extra stakes were installed to try to prevent wattle loss.
4. Economy and the school system to allow kids to visit the site and uses of buses
5. More trials needed to be done to find a more suitable variety of vegetation in which the farmer would also find beneficial towards current crops.

Ideas on ways to improve aspects that did not work well:

1. Possibly work with college classes and professors to gain on site learning.
2. Research more varieties and planting times which coincide with current planting practices of the farmer and crop.
3. Establish cover crops prior to planting row crops allowing the established cover crops to remain on the bottom quarters of the field.
4. More trials needed to be done to find a more suitable variety of vegetation in which the farmer would also find beneficial towards current crops.

Future activity recommendations for the watershed:

Get the community more informed and involved with the impacts of runoff of farm residential and commercial properties and how they affect our water!

Appendix G: Open Nonpoint Source Grants and Associated Projects

State Project #	Project Title	Award Fiscal Year	Total Grant Award	NPS Grant Number	Funding Split	Project Start Date	Project End Date
8-007	Eagle Creek Watershed Restoration	2005	$360,930	96936505	$252,199	5/17/2006	4/30/2010
				97959603	$21,886		
				96973406	$4,034		
				97959609	$82,811		
9-001	Sediment Reduction in Whitewater Draw using Watershed Partnership	2005	$114,950	96936505	$61,283	11/19/2007	9/30/2010
				96973406	$19,184		
				97959609	$30,033		
9-006	Optimizing Reclaimed Water, Groundwater & Stormwater Inputs at Tucson's Lakeside Lake	2006	$54,978	96973406	$24,920	6/29/2007	6/30/2010
				96998407	$27,647		
9-007	Granite Creek Watershed –Phase II	2005	$99,062	96936505	$55,065	10/1/2007	3/31/2013
				96973406	$32,296		
				98961308	$11,701		
9-008	Watson Woods Riparian Preserve-Phase I	2005	$483,191	96936505	$273,427	7/12/2007	3/31/2013
				96973406	$30,531		
				98961308	$179,233		
10-002	Sediment Reduction into Diamond Creek and the Colorado River	2006	$35,000	96973406	$0	8/11/2008	12/30/2011
				97959609	$35,000		
10-005	White Mountain Apache Tribe's Water Quality Improvement Grant	2007	$250,000	96998407	$194,663	7/1/2008	12/31/2010
				96973406	$55,337		
10-006	Tonto Rim Christian Camp Water Quality Improvement Project	2006	$260,000	96973406	$125,021	6/26/2008	6/30/2011
				96936505	$134,979		
10-007	Sustainable Design for the Southwest Family Services Center Pervious Concrete Demonstration to Mitigate Stormwater Pollution	2006	$251,400	96973406	$219,341	2/22/2010	6/30/2012
				96998407	$32,059		
10-009	Ash Creek Watershed Improvement Project	2007	$32,382	96998407	$31,955	7/1/2008	6/30/2010
1.00E-09	Creating a Neighborhood Model to Address Urban Stormwater Pollutants	2007	$103,240	96998407	$68,818	7/1/2008	8/13/2010
				96936505	$34,422		
1.00E-10	Oak Creek Canyon Water Quality Improvement Program	2007	$53,490	96998407	$30,226	7/1/2008	10/31/2010
				96936505	$23,264		
1.00E-13	From Education to Action in the Granite Creek Watershed	2007	$67,875	96998407	$40,713	7/1/2008	8/31/2010
				96936505	$17,953		
				96973406	$10,209		
11-001	Septic Tank Closures from Program Year 8 of Lake Havasu City's Sewer Expansion Program	2008	$300,000	98961308	$155,679	9/16/2009	6/30/2011
				96973406	$144,321		

State Project #	Project Title	Award Fiscal Year	Total Grant Award	NPS Grant Number	Funding Split	Project Start Date	Project End Date
11-004	Wenima Wildlife Area Stream Restoration	2007	$74,145	96998407	$74,145	7/1/2010	6/30/2012
11-005	Water Quality Improvements for Francis Short Pond	2008	$25,164	98961308	$25,164	8/4/2009	6/30/2011
11-006	Middle Fossil Creek Water Quality Improvement Project	2008	$211,825	98961308	$211,825	8/7/2009	6/30/2011
11-007	Sediment Reduction from Runoff Using Best Management Practices	2007	$37,453	96998407	$37,453	8/17/2009	6/30/2011
11-T01	Granite Creek - Watson Lake Watershed Improvement Plan	2008	$299,961	98961308	$199,496	6/4/2009	5/30/2011
				96973406	$20,570		
				96998407	$79,895		
11-T02	San Francisco - Blue River Watershed Improvement Plan Grant	2006	$188,437	96973406	$125,563	6/4/2009	5/30/2011
				96998407	$62,874		
11-T03	Oak Creek Targeted Watershed Improvement Plan (EV09-0035)	2008	$311,603	98961308	$137,231	10/1/2009	9/30/2011
				96998407	$174,372		
12-001	Septic Tank Closures for Program Year 9 of Lake Havasu City's Sewer Expansion Project Year 9	2009	$550,000	97959609	$208,406	8/30/2010	6/30/2012
				98961310	$341,594		
12-002	Coyote Creek Watershed-scale Education and Training Grant	2009	$123,604			8/3/2010	6/30/2012
12-003	San Pedro River Watershed Implementation Plan	2009	$265,551	98961308	$265,551	8/24/2010	6/30/2012
12-004	Community Stewardship Model for Green Streets	2009	$163,396	96998407	$163,396	8/13/2010	6/30/2012
12-005	*E.Coli* Reduction in the San Francisco River through Alternative Livestock Water on Kaler Ranch Phase II	2009	$100,246	97959609	$100,246	8/13/2010	6/30/2012
12-006	Upper Gila Watershed Steward Project, Phase II	2009	$44,200	96998407	$12,518	8/13/2010	6/30/2012
				98961308	$31,682		
12-007	Tonto Watershed Improvement Group Watershed Education and Training	2009	$70,791	98961308	$3,537	8/17/2010	6/30/2012
				97959609	$67,254		
12-008	NPS Reduction of Copper to Pinto Creek	2009	$595,370	97959609	$334,183	TBD	6/30/2012
				98961310	$261,187		
EV08-0168	National Nonpoint Source Education of Municipal Officers Model (NEMO)	2007	$369,000	96998407	$311,110	7/1/2008	6/30/2010
				97994404	$57,890		

State Project #	Project Title	Award Fiscal Year	Total Grant Award	NPS Grant Number	Funding Split	Project Start Date	Project End Date
EV11-0008	Project WET	2010	$29,262	96998407	$6,235	7/28/2010	5/15/2012
				98961310	$23,027		
EV11-0009	Arizona Nonpoint Source Education for Municipal Officials (NEMO)	2010	$334,183.00	98961308	$124,921	7/1/2010	6/30/2012
				97959609	$42,171		
EV11-0010	Master Watershed Stewards Program	2010	$210,588.00	00195008	$64,961	7/1/2010	6/30/2012
				00201009	$110,145		
				00301010	$35,482		
EV11-0011	Technical & Analytical Support for *E.coli* Source Identification in Targeted Impaired Waters	2010	$59,482.00	96973406	$29,741	7/1/2010	6/30/2012
				98961310	$29,741		