Arizona's 2008 Nonpoint Source Annual Report

Nonpoint Source Program July 1, 2007 - June 30, 2008

Prepared by

Water Quality Division, Planning Section

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

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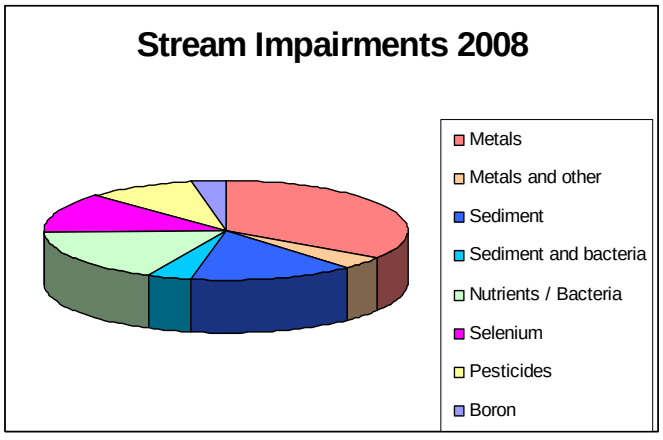
Chapter 1

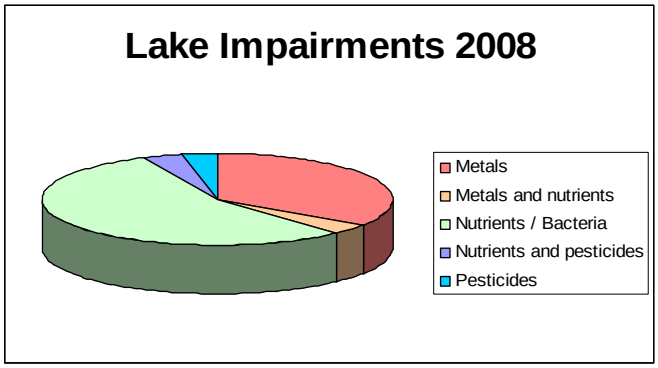
Arizona's Nonpoint Source Pollution

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 our underground sources of drinking water. 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 (draft 2006) 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 Draft Status of Ambient Surface Water Quality in Arizona (Arizona's Integrated 305(b) and 303(d) Listing Report) indicates that Arizona has 14 lakes and 72 streams impaired by these pollutants. During the 2004 assessment and listing cycle, EPA listed an additional 14 lakes and 13 streams. (The status of EPA's listings will be determined during EPA's review period.) Although in a few drainages point sources may be contributing, all of these impairments are primarily the result of nonpoint source contributions.





Sediment – Most of the pollutants causing impairments are transported with sediment; therefore, reducing erosion and sediment transport will reduce pollutant loadings causing impairments. Mitigation and remediation efforts must also deal with contaminated sediments (nutrients in lakes, metals near mines).

Land uses have the potential to increase sediment transport or cause erosion – construction, grazing, mining, roads, forestry, and even recreation. ADEQ promotes the use of practices (Best Management Practices, i.e., BMPs) that will reduce these impacts to water quality.

Nutrients and bacteria – Recent investigations have shown that nutrients and *Escherichia coli* (*E. coli*) bacteria are primarily being contributed by inadequate septic systems, livestock, irrigated crop production, and human impacts in recreational areas due to inadequate toilets and trash, including animals attracted to the garbage left behind or feeding geese at urban lakes. ADEQ has learned that community-wide or watershed-wide plans and project implementation are needed to address such contributions. Replacing a dozen scattered septic systems will have only short term reductions in areas where 500 systems are inadequately sized and located adjacent to a stream. Trash clean-up campaigns have only short-term impacts if the reasons why the trash is being left have not been addressed.

Metals – High concentrations of metals, especially dissolved metals, primarily pose a risk to aquatic life because low concentrations can be highly toxic. However, metal pollutants can also harm humans if at a high enough concentration.

Arizona has extensive areas of mineralized rock, and therefore, a high potential for metals pollution. Metals leach more readily from soil or mineralized rock that has been exposed by mining or construction/development activities. Ore bodies and springs that recharge our streams can also naturally contribute metals to our streams.

Acidic conditions may occur near mining activities. The lower the pH of the water (more acidic), the more likely metals will be in their more toxic dissolved state. The more neutral or alkaline the water conditions, the more metals adhere to sediment and are less toxic. Fortunately, most of Arizona's lakes and streams are relatively alkaline. When metal-contaminated sediment is transported downstream to a lake, the water slows and the sediments drop to the bottom of the lake, where the contamination becomes buried under layers of sediment. Therefore, most metal exceedances occur near mines and seldom occur in lakes.

Worlds Fair Mine and Stream Below

The exception is mercury. In lakes, mercury bioaccumulates in the food chain, with top predator fish having higher mercury concentrations than forage fish. Mercury poses a serious health concern to humans and other animals that prey on fish contaminated with mercury. Fish consumption advisories have been issued in 11 lakes due to mercury contamination in fish and EPA has listed these lakes as impaired.

Mercury is naturally present in rock formations in Arizona. Abandoned and inactive mine tailings piles, if not stabilized, can erode and add mercury and other metals into the surface water. Such piles are scattered across Arizona. Also, mercury was used in historic gold mining processing.

Significant potential point sources of airborne mercury have been shown to be the source of mercury across the United States (*Mercury Study Report to Congress*, EPA, 1997). These sources include coal-fired power plants, waste incinerators, cement and lime kilns, smelters, pulp and paper mills, and chlor-alkali factories. ADEQ is currently developing a number of mercury TMDLs for lakes and is collecting data to quantify the mercury contribution from atmospheric deposition.

Selenium Could Impact Aquatic Life and Birds

Selenium – Selenium bioaccumulates and can cause reproductive effects to fish and waterfowl. Selenium naturally occurs in Arizona's soils and in the upper Colorado River drainage coming into Arizona. It also has a very narrow concentration range between nutritional requirements and toxicity. Anthropogenic sources of selenium in Arizona may include: irrigated agriculture return flows, combustion of fossil fuels, coal mining, sulphide ore mining (copper, lead, zinc mines) and animal feed supplements.

Pesticides – The historic use of pesticides is the primary source of pesticide contamination problems in Arizona. Pesticides such as DDT, toxaphene, and chlordane that were sprayed onto cotton and citrus fields have subsequently been banned from use, but take a long time to degrade. Small concentrations of these contaminants bio-accumulate in the food chain, passing higher concentrations on to offspring and predators, including humans. The presence of pesticides in fish tissue has lead to fish consumption advisories being posted in stream reaches and lakes below the Phoenix Metropolitan area down to Painted Rocks Dam.

Chapter 2

Program Purpose and Goals

This report is an overview of the Arizona Department of Environmental Quality (ADEQ) Nonpoint Source Program (the Program) activities for fiscal year 2008 (June 30, 2007 through July 1, 2008). The majority of work performed by ADEQ's Nonpoint Source Program is funded by Clean Water Act Section 319(h) grants, awarded by the U.S. Environmental Protection Agency (EPA).

ADEQ's Nonpoint Source Program operates under the guidance of Arizona's 5-Year Nonpoint Source Management Plan (the State Management Plan) which was last revised and released in November 2003. The State Management Plan is currently under revision. This will be the last report under the 2003 State Management Plan.

ADEQ has been successful in meeting the goals identified in the State Management Plan. Throughout this report, ADEQ will provide a summary of the progress in meeting short- and long-term goals. In addition, this report will highlight all of the accomplishments in the Nonpoint Source Program over the past five years and provide supplemental information as a means of assessing progress to date and improving the program in the future.

Arizona's Nonpoint Source State Management Plan integrates the state's Clean Water Act and Safe Drinking Water Act programs with voluntary incentives. ADEQ uses a combination of tools including surface and ground water monitoring, watershed inventories, watershed characterizations, Total Maximum Daily Load (TMDL) studies, TMDL implementation and source water assessment plans, watershed-based plans, and water quality improvement projects to protect the state's water resources from nonpoint source pollution. Staff works 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. 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.

Milestones have been placed on long-term goals and short-term objectives which outline the State's implementation strategy for the restoration and protection of designated uses impaired due to nonpoint source pollution. The long-term goals listed are desired end points based on a 10- to 15-year time frame. The short-term objectives or milestones listed below have been implemented and revised as necessary over the last five years such that beneficial uses of the state's waters (to the extent practicable) are fully restored or maintained. Many of the milestones are taken from ADEQ's EPA-approved workplan. The tasks and deliverables scheduled as part of the workplan were designed to attain our long-term goal of implementing a dynamic and effective Nonpoint Source Program intended to achieve and maintain designated uses of water.

Program Accomplishments and Enhancements

The Program has facilitated and promoted 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 as well as protecting waters that are attaining their designated uses. ADEQ uses a combination of tools including surface and ground water monitoring, watershed inventories, Total Maximum Daily Load (TMDL) studies, TMDL implementation, watershed based plans, and water quality improvement projects to protect the state's water resources from nonpoint source pollution. Over the past reporting year, the following program accomplishments and enhancements were made.

Water Quality Improvement Grant Program

The Water Quality Improvement Grant Program (Grants Program) has taken a new direction. The former direction of the Program was simply the administration of funds. The Program is now offering a move in a more comprehensive direction by becoming invested in projects. The Grants Program has implemented the following new components: monitoring effectiveness of past and future projects, technical support prior to application submittal, TMDL working group, educational priorities and the development of project criteria, and quantifying load reductions in source pollution. The Grants Program has moved into an outcome based framework and all program and project decisions made are based on results and credibility. The sections below will outline the major enhancements in more detail.

Grant Effectiveness Evaluations

ADEQ has initiated a systematic review of past water quality improvement grant projects and individual practices implemented to determine long-term successes and weaknesses. Although most projects were successful when implemented, ADEQ is determining which on-the-ground projects and educational components have resulted in long-term and significant impacts on water quality and changes in behavior.

Information is gathered through discussions with past project managers, visiting the sites, and some monitoring. For projects that were intended to improve an impaired surface water quality, the evaluation is coordinated with the TMDL Program.

After only six months of site visits, the effectiveness evaluations have revealed some important issues that should be considered during future grant cycles.

- Project impact may be insignificant because of the scale of the project compared to the scale of the problem.
- The long-term impact of the project is negligible because the underlying problem has not been resolved. For example, cleaning up trash on public land has been effective when low-income homeowners lack inexpensive facilities to transport trash and bulky items such as appliances, furniture, and campers. The lack of political will and agency resources to enforce regulations controlling such dumping is also an unresolved issue.

- The agency land owner lacks the resources to maintain the improvements or provide adequate supervision.
- The project implemented BMPs on individual properties without considering the watershed needs.
- The project had inadequate ADEQ site evaluation of the proposed improvement practice to determine if it was the best BMP for that site.
- The grants end before long-term water quality improvements can be measured. Generally, measurements being collected can not readily be used to determine success of the project because of ephemeral conditions or other sources.

The issues identified through the grant effectiveness evaluations could be addressed through the development of Watershed Improvement Plans (WIPs) which identify and prioritize critical projects that need to be implemented, especially in drainages with impaired surface waters. The planning process would encourage the involvement and commitment needed to maintain improvements. Technical appropriateness and potential effectiveness could be professionally evaluated during the process. The plans could clearly define which projects are most likely to effectively resolve or prevent water quality impairments. (See discussion on Watershed Improvement Plans Grant Opportunity below).

In evaluating the potential success of a project, the Grants Program focuses on the project's likelihood of success in reducing pollutants and changing behaviors. The program is developing methods to better determine several key factors:

- Technical feasibility, effectiveness, adequacy of the project to address the problem.
- Willingness and capability of the landowner and tenants to
    a. Maintain the project,
    b. Enforce proper use or behaviors and maintain a "presence" at the site,
    c. Provide effective education opportunities that will cause long-term behavioral change.

Impaired Waters Strategy

ADEQ has a comprehensive strategy for improving water quality on Arizona's impaired waters that will lead to these waters meeting standards. Once a surface water has been listed by either ADEQ or EPA, ADEQ's 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 pollutants of concern. A spreadsheet was developed which tracks the progress of each impaired surface water, generally progressing from Level A to F. The six (6) levels are:

- Level A – Investigate and develop TMDL
- Level B – Develop a plan or strategy to identify and prioritize improvement projects
- Level C – Implement the plan
- Level D – Assign to EPA because ADEQ lacks jurisdiction (e.g., pollutant sources are entirely in Mexico)
- Level E – Re-evaluate impairment due to watershed improvements, new standards, or natural conditions based on new data
- Level F – Request delist

This table is a useful tool for communicating between programs at ADEQ and with other agencies, to coordinate efforts, and bring together funding resources. It should also be useful in tracking the effectiveness of the Nonpoint Source Program in improving surface water quality.

TMDL Working Group & Watershed Improvement Plans

The Grants Program gives priority to projects that are supported by a Watershed Based Plan and Total Maximum Daily Load (TMDL) Report. Priority is also given to projects that are located in an impaired reach and that can provide estimated load reductions. By investing in these projects, ADEQ is able to provide data proof that water quality improvements are being made. Therefore, it is important that the Grants Program work closely with ADEQ's TMDL Program. Over the past year the Grants Program has developed a strong working group with the TMDL Program. This working group has identified areas that are impaired, have active participation in the community, and could manage a water quality improvement project. The Grants Program will continue to give priority points and target grant dollars to these areas of concern.

Watershed Improvement Plans Grant Opportunity

The Watershed Improvement Plan Grant Opportunity is a new grant opportunity that will be piloted in FY09. Targeted Watershed Improvement Plans (WIPS) are needed to identify and prioritize water quality improvement projects critical to restore water quality. These plans are targeted at specific pollutants causing impairments within a targeted drainage area. The objective of this grant is to focus future grants on priority projects identified in the plan, so that in the future impaired water will meet water quality standards. The success of the new opportunity depends on a variety of factors such as community education and involvement, prioritization of projects, resources, funding sources, and successful implementation.

Educational Priorities

The Grants Program has started targeting funds to educational programs directly tied to water quality impairments and improved water quality. In order to move in this direction, the Grants Program had to develop outcomes, criteria, and priority projects. The Grants Program launched its first competitive education grant cycle in FY08. New education grants target a diverse audience, while also addressing specific water quality issues around the state.

Nonpoint source Education for Municipal Officials (NEMO)

The Arizona Cooperative Extension at the University of Arizona and ADEQ began the NEMO program in the fall of 2002. Since then, the contract has been extended through 2010. The NEMO program provides education for land-use decision makers on watershed-based planning and management practice for restoring, maintaining and protecting watersheds, water quality and water sustainability. NEMO has expanded its service and is working with other active watershed groups to assist them in the development of watershed-based plans. NEMO has identified stakeholders and met watershed education needs with community-based programs, presentations, and publications. NEMO staff regularly attends watershed partnership meetings throughout the state to provide technical assistance and support.

The NEMO Program has generated nine Watershed Based Plans, with the last four scheduled for submittal to ADEQ in August 2008. Since FY03, NEMO has provided support to five applicants resulting in eleven successful grants for a total of approximately $1,475,000 toward water quality improvements. This number is anticipated to increase over the next two years.

Colorado River Coordinator

In FY08 a position was created within the TMDL Unit to act as the Colorado River Coordinator. This position represents the ADEQ Water Quality Division at regional meetings, collaborates with other ADEQ divisions when necessary on specific issues, and develops TMDLs along the main stem of the Colorado River and its tributaries. The TMDL Program filled this position in November 2007. This position currently acts as co-chair of the Lake Powell Cooperators Group.

Memorandum of Understanding

The Forest Service and ADEQ share the common objective of improving and protecting the nation's water by implementing watershed-based restoration protection programs and meeting water quality standards and designated uses. The Forest Service and ADEQ have developed a strong working relationship and a partnership valued by both agencies. In 1991 the Forest Service and ADEQ entered into an Intergovernmental Agreement. Since then both agencies have strengthened their water quality programs and the Intergovernmental Agreement has been changed into a Memorandum of Understanding. Though the purpose of this instrument has remained the same, the Forest Service and ADEQ have revised and updated the language in the document. The Memorandum of Understanding was finalized and signed in FY08.

Calculating Load Reductions

ADEQ will continue to be pro-active in securing load reduction estimate information from grantees. Projects proposed with useable estimated load reductions will rank higher than projects that do not have projected quantitative measures of success. If estimated load reductions are unknown, ADEQ encourages monitoring either by the grantee or ADEQ so that data can be used to quantify success for GRTS reporting. Evaluating and assessing BMP effectiveness and obtaining more load reduction data remains a program priority.

Approximately 28 projects had amounts entered into the GRTS system reporting load reductions for FY 07/08.

The following is a summary report on where Arizona ranked compared to the other 49 states:

Nitrogen = AZ ranked 27th with reported load reductions of 23,894 pounds
Phosphorus = AZ ranked 32nd with reported load reductions of 3,683 pounds
Sediment = AZ ranked 7th with reported load reductions of 91,521 tons

Impaired Water Identification Rule

Staff is drafting revisions to the Impaired Water Identification Rules 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.

2006-2008 Integrated 305(b) Assessment and 303(d) Listing Report

The 305(b) Water Quality Assessment Report describes the status of surface and ground water resources in Arizona in relation to state water quality standards. The report is integrated because it fulfills requirements of Section 305(b) of the federal Clean Water Act. Accompanying the report is a list of Arizona's impaired waters, as required by Section 303(d) of the Clean Water Act. Together the report is called the Integrated Report of Water Quality.

The Standards and Assessment Unit is working on the 2006-2008 Report which was due to EPA on April 1, 2008. ADEQ expects to submit the Integrated Report to EPA Region 9 in October, 2008. The 2008 assessment report will be combined with the 2006 report.

Chapter 3

Federal Support

ADEQ continues to work with state and federal land managers to address nonpoint source pollution impacts on water quality. Many activities throughout the year demonstrate ADEQ's commitment to working with federal and state land managers to improve water quality in the State.

Arizona achieves federal support through partnerships and stakeholder efforts implemented 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 is able to work with federal agencies to incorporate other appropriate water quality controls and further the goals of the Nonpoint Source Program. Another way ADEQ works and partners with Federal agencies is through community-led watershed groups. 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 federal partners are able to more easily identify, assess, and help implement voluntary efforts to control nonpoint source pollution.

Coordinated Resource Management

One forum for interagency coordination is Arizona's Coordinated Resource Management (CRM). A formal agreement between federal and state agencies established an Executive Committee and task groups to coordinate natural resource management across the state. Agencies participate in planning, implementation of resource improvements, and monitoring of resource areas. This has been particularly effective in working on ranch management plans, where land ownership is a checkerboard of state and federal agencies, and larger landscape questions concerning recreational opportunities, such as designating off-road vehicle areas. CRM Working Groups have been effective at bringing together ranchers to look at cumulative effects of grazing and how to qualify for various funding opportunities to implement improvements.

CRM is working at two levels. One is the local level which brings land owners (federal and state agencies), land uses (such as ranchers, environmentalists), and resource managers (other federal and state agencies) together as a team to formulate and implement plans for the management of resources within a specific area or to resolve conflicts or issues. Another important function has occurred at the Executive Committee or State Technical Committee level. These meetings provide a forum to exchange information concerning agency priorities, new techniques, and funding opportunities which can then be shared with the local Working Groups.

CRM is in the process of establishing a website as a tool for facilitating the planning efforts and has begun to work closely with the NEMO Project. Tools and information

developed for NEMO, such as the web-based interactive mapping system and information concerning Best Management Practices, will directly benefit Arizona's Coordinated Resource Management efforts.

Environmental Assessment Reviews

Another example of interagency coordination is ADEQ's active participation in the National Environmental Policy Act (NEPA) planning and decision making process. NEPA requires that all federal agencies prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. ADEQ provides technical information concerning the status of water quality in the area of concern and recommends appropriate management practices to improve or maintain the resources. This process encourages the mitigation of nonpoint source impacts on water quality whenever a federal action is being considered.

319 Projects Leveraged with Federal Funds
Six projects awarded during the grant Cycle 10 (June 2008) were leveraged with federal money and/or federal support.

On-the-Ground Grants

10-001 Pioneer Park Stormwater Quality Improvement Plan
The Yavapai County Flood Control District was awarded a grant to implement best management practices to reduce runoff from Pioneer Park, located in Prescott on land owned by the Bureau of Land Management (BLM). Funded BMPs include vegetated runoff detention basins, rip rap and check dams to reduce erosion and slow runoff from the site, and the installation of pervious asphalt in part of the parking area to promote on-site infiltration, reducing runoff and increasing groundwater recharge.

10-003 Eagle Creek Watershed Restoration – Double Circles Ranch Phase III
The Coronado RC&D was awarded a grant to implement the third phase of water quality improvement practices to alleviate nonpoint source pollution by excluding cattle from Eagle Creek and other riparian areas. *Upper Eagle Creek Watershed Restoration Project – Double Circles Ranch Phase III (10-003)* will be conducted on U.S. Forest Service owned ranching allotments. Goals of this project are to install fencing that will exclude livestock from Eagle Creek, and to install a combination of fencing and alternative water sources that will remove cattle from Sheep Springs and Smith Canyon (a tributary to Sheep Springs). Removing cattle from these areas will reduce sediment and nutrient loadings into these water bodies, and protect the integrity of the riparian areas surrounding them. The project has federal support from USDA NRCS, as well as the U.S. Fish and Wildlife Service.

10-004 Mesquital Fence Project
The Coronado RC&D will also be managing a grant awarded to the U.S. Forest Service to install livestock fencing in the Santa Cruz-Rio Magdalena-Rio Sonoita Watershed in the borderlands area of southern Arizona. The project will include constructing a fence approximately 1 mile long to split the flatter western portion of the Mesquital pasture

from the steeper eastern portion. Sycamore Canyon and a portion of Providencia Canyon will be fenced in with the flatter western portion (Lower Mesquital) where livestock are more prone to spread out and not congregate in the drainage bottom.

10-009 Ash Creek Watershed Improvement Project
The Mingus Springs Camp & Outdoor Learning Center received its second Water Quality Improvement Grant to help protect the headwaters of Ash Creek on the Upper Agua Fria watershed from water pollution caused by increased prescribed burning, illegal off-road vehicles, and logging practices in the watershed.

To reduce nonpoint source pollution loadings to Ash Creek, the project will install sediment traps and gabion structures, re-seed, close illegal roads and OHV trails, and make improvements to the main road to the camp to reduce sediment flowing off the roadway into the creek. The project will focus not only on land owned by the Camp, but also adjacent Forest Service land. The Forest Service has offered support for this project, and will provide technical assistance. The USDA-ARS Southwest Watershed Research Center also supports this project and its efforts to reduce sedimentation to Ash Creek.

Education Grants

10E-010 Creating a Neighborhood Model to Address Urban Stormwater Pollutants
The Watershed Management Group, a Tucson-based non-profit organization, received an education grant to train residents of the Rincon Heights neighborhood in Tucson in nonpoint source pollution issues, as well as best management practice implementation and maintenance. The project is supported by the USDA NRCS Tucson Plant Materials Center, who will provide planting supplied for vegetated buffer strips, as well as technical support on the project.

10E-013 Gila Valley NRCD Best Management Practices on Crop Land
Gila Valley NRCD was awarded a grant to educate local farmers and the public about best management practices that can be used to reduce nonpoint source pollution from crop lands. The project also features an implementation component, where vegetated bugger strips will be installed across the edges of irrigated fields. Education will take place through various classroom and hands-on workshops, news articles, publications, and field visits to view practices being implemented successfully. Local high school students will participate in the project by assisting with BMP installations and sampling activities.

Chapter 4

TMDLs, Implementation and Monitoring

TMDLs

The Total Maximum Daily Load (TMDL) Program is designed to help an impaired stream or lake meet its water quality standards and support its designated uses, such as protection of aquatic life, drinking water, or fish consumption. Section 303(d) of the Clean Water Act establishes authority for the TMDL Program and guides states on how to develop these plans for waters that do not meet water quality standards.

Implementation and Effectiveness Monitoring

Boulder Creek

Coordination efforts with the three land managers/owners of the Hillside mine tailings piles continue. Remediation efforts have progressed slowly as funding sources and remedial approaches change.

Turkey Creek

The Forest Service has completed remediation efforts at the Golden Belt and Golden Turkey mines. An effectiveness monitoring SAP has been developed and is being implemented. Preliminary results indicate that copper and lead loads from the remediated mines have been reduced.

Alum Gulch

The Forest Service has completed remediation efforts of the World's Fair and Humboldt mines tailings and waste rock piles. Adits in the watershed continue to discharge to the stream with efforts continuing to address these sources of pollutants. An effectiveness monitoring SAP has been developed and is being implemented.

Tonto Creek

An effectiveness monitoring SAP has been developed and is being implemented. Sampling will continue through the summer of 2008 to determine current conditions in the watershed.

Pinto Creek

ADEQ has proposed a dissolved copper site specific standard of 42 ug/L for the main stem of Pinto Creek. The standard is included in the current triennial review of water quality standards which is anticipated to be completed by the end of the calendar year. Water quality results indicate that the copper loads from the Gibson mine have decreased by 50% but still exceed applicable standards. Additional work may be required at the site.

TMDL Development

ADEQ is adopting a mercury fish tissue standard equal to 0.3 mg/kg which is consistent with EPA criteria. Once the standard has been adopted ADEQ can submit mercury TMDLs to EPA for approval.

Lake Mary Region

The draft report is near completion. Additional work has been completed to determine natural watershed contributions to the lakes. However, questions have arisen regarding the fish species within the lakes. Originally all five lakes were believed to contain walleye and therefore it was the target species. Recent fish surveys indicate that only Upper Lake Mary may be supporting walleye. A change in the target species would affect the TMDL calculations. ADEQ will meet with AGFD to determine the correct target species for each lake.

Alamo Lake

The Alamo Lake TMDL has been updated to include waste load allocations for all permitted discharges of mercury in the watershed. Stakeholder comments, adoption of implementation procedures and a fish tissue standard have delayed final submittal of the TMDL for approval. Additional soil sampling has occurred and the model will be run with the updated information to determine natural watershed loads

Parker Canyon Lake

Modeling for Parker Canyon Lake has been completed. ADEQ is awaiting the final modeling report in order to calculate the TMDL.

Lyman Lake

Sampling has continued within Lyman Lake and its watershed. Additional water quality, precipitation, and fish tissue data have been collected. ADEQ anticipates completing data collection this summer.

Queen Creek

Winter storms provided adequate samples for Queen Creek and its watershed. Data entry is nearing completion. Once completed, it will be incorporated into the hydrologic model and the copper TMDLs will be calculated based upon model results.

San Pedro River

Data collection on the lower San Pedro River continues. Sampling for selenium and *E.coli* began last fall and will continue through the summer.

Gila River

The upper Gila River *E. coli* and sediment TMDLs are being drafted. Data collection has been completed with submission to EPA anticipated in the fall.

Santa Cruz River

Sampling efforts were initiated on the upper Santa Cruz River. Potential sources include the International Waste Water Treatment Plant, uncontrolled discharges from

Mexico and natural contributions. Preliminary results show high *E. coli* and nutrient levels.

Little Colorado River
Staff has collected several rounds of sampling along the middle Little Colorado River near Holbrook. Sources of *E. coli*, metals and sediment are being investigated.

Mule Gulch
Sufficient natural background data was collected in the 2007 summer monsoon season to attempt modeling a site specific standard. The contractor has the data with results expected by fall.

Atmospheric Deposition of Mercury

EPA continues to support ADEQ efforts to characterize the rate of atmospheric mercury deposition within the state. Atmospheric deposition, wet or dry, is a major source of mercury contamination throughout the country. While various efforts have been completed to characterize this problem on a national scale, limited data exists specific to Arizona. ADEQ recognizes the lack of atmospheric deposition data poses a serious problem to TMDL development. ADEQ continues to operate the Mercury Deposition Network (MDN) station in Arizona. Weekly wet deposition concentrations and rates are calculated from the data collected at the site.

ADEQ, in cooperation with EPA Region IX, has collected atmospheric mercury concentration data at several sites across the state. The data is currently being analyzed by an EPA contractor to determine site specific dry deposition rates for Arizona.

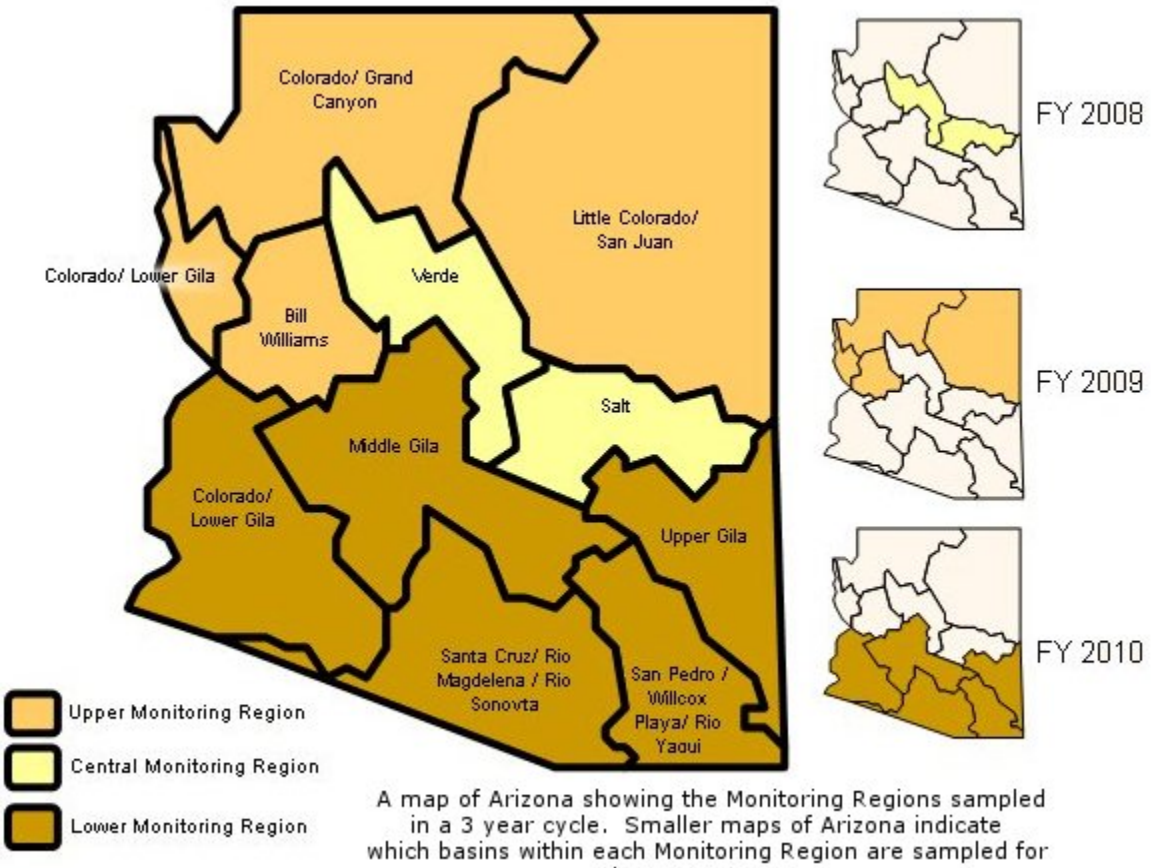
The goal is to establish Arizona specific wet and dry deposition rates to compare to rates determined by national models.

Water Quality Monitoring

ADEQ employed a probabilistic and targeted approach to sample site selection for wadeable perennial streams in FY 08. ADEQ field personnel visited every sampling site during four quarters of the year and collected field data and water samples to be analyzed for chemical constituents. Biological and habitat information for wadeable perennial streams were collected once during the spring quarter.

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 2008, the USGS monitored 11 sites throughout the state for ADEQ.

ADEQ has identified 10 major river basins in Arizona as part of the basin monitoring program. Water quality monitoring has been conducted at sampling sites located in two major basins each water year. All 10 basins are monitored over a three-year cycle.



A map of Arizona showing the Monitoring Regions sampled in a 3 year cycle. Smaller maps of Arizona indicate which basins within each Monitoring Region are sampled for the next 3 years.

Chapter 5

Water Quality Improvement and Load Reductions

As Arizona continues to focus efforts on restoring and protecting waters, it is critical that ADEQ monitor both:

1) The progress being made towards achieving and maintaining water quality standards;
2) The implementation of programs and projects to assure that they are successful.

ADEQ employs several environmental management measures which indicate progress towards achieving and maintaining beneficial uses of water and thus the success of the Nonpoint Source Program. Ambient water quality monitoring, biological and physical assessment, implementation monitoring, model projections, and photographic evidence are some of the management measures ADEQ staff utilizes to determine effectiveness in restoring and/or protecting water quality. Environmental Management Measures are also an essential tool to enable ADEQ to identify nonpoint source pollution problems, develop effective watershed-based plans, evaluate the effectiveness of actions taken, and meet Section 319 reporting requirements.

Water Quality Improvement

Ambient water quality and biological and physical assessment data are compiled in *Arizona's Integrated 305(b) Assessment and 303(d) Listing Report* which reports the status of water quality in Arizona. ADEQ uses the Integrated Report for overall program status and trends and to compare the quality of Arizona's surface waters to water quality standards. This report assesses all surface waters where monitoring has been conducted, reports on the quality of ground water, lists any impaired surface waters, and prioritizes these waters for TMDL development. This water quality assessment report is another means by which ADEQ can determine the effectiveness of management measures implemented to control nonpoint source pollution.

Note that there are many factors that might affect results. For example, completion of a TMDL on a surface water usually allows ADEQ to remove that surface water from the 303(d) List (Category 5) to Category 4 or the "not attaining" list. However, further monitoring during the course of the TMDL study may reveal impairment based on additional parameters. The surface water must then remain on the 303(d) List for the new parameters, giving the appearance that no progress has been made, when in fact some water quality problems have been addressed. These types of variables often skew the results of effectiveness measures and make it difficult to measure water quality improvement by comparing assessments from one year to the next.

TMDLs

The Total Maximum Daily Load (TMDL) Program is designed to help an impaired stream or lake meet its water quality standards and support its designated uses, such

as protection of aquatic life, drinking water, or fish consumption. Section 303(d) of the Clean Water Act establishes authority for the TMDL Program and guides states on how to develop these plans for waters that do not meet water quality standards.

For each TMDL, ADEQ is required to establish a TMDL implementation plan that explains how the allocations and any reductions in existing pollutant loadings will be achieved (Arizona Revised Statute §49-234.G).

Developing implementation plans is an integral piece of the TMDL process. The achievement of water quality standards in most surface waters will occur due to voluntary efforts such as voluntary cleanup actions, voluntary implementation of best management practices, volunteer monitoring, and education. Stakeholders are encouraged to participate throughout the process and identify actions that they will take to ensure that this plan is implemented.

Watershed-based Plans and TMDL Implementation Plans
Watershed-based plans are holistic documents that are developed and implemented to protect and restore a watershed. These plans provide a careful analysis of the sources of water quality problems, their relative contributions to the problems, and alternatives to solve those problems. Furthermore, watershed-based plans deliver proactive measures to protect surface waters.

Water quality improvement plans are vital components to ensure Arizona's lakes, rivers, and streams achieve applicable water quality standards. ADEQ contracts with Arizona NEMO to develop watershed-based plans for Arizona's ten major ten-digit-hydrologic unit code (HUC) watersheds. Watershed Based Plans have been completed and are online for the Bill Williams, Upper Gila, Verde River, Little Colorado River Watersheds, Upper Agua Fria, Middle and Lower San Pedro sub-watersheds, Santa Cruz, Salt, and Middle Gila Watershed. The Plans can be viewed on-line at www.arizonanemo.org. Further watershed-based plans are currently being developed for the Colorado-Lower Gila, Colorado-Grand Canyon, San Juan and San Pedro.

Watershed Partnerships and Other Active Stakeholder Groups
Watershed partnerships and other active stakeholder groups contribute to the progress of the Nonpoint Source Program. ADEQ's web site provides a list of Arizona Watershed Partnerships (www.azdeq.gov/environ/water/watershed/partnerships.html).

Water Quality Improvement Projects
The availability of grant funds available through Section 319 of the Water Quality Act is a critical element in improving and protecting water quality in watersheds throughout the state. During the last grant cycle, ADEQ received nineteen grant applications, one which was ineligible due to the lack of an on-the-ground component. Of the nine projects awarded in June 2008, three will address water quality improvements in impaired waters. All three of these projects are located in areas that have a completed TMDL. Appendix B lists the projects awarded in FY 08.

The following are priority projects from Cycle 10 that implement BMPs that are addressed in either a TMDL or a WBP.

On-the-Ground Projects in Impaired Waters

Gila County
Tonto Rim Christian Camp
Tonto Rim Christian Camp Water Quality Improvement Grant
$260,000

This project will protect and preserve the ground water quality in Tonto Creek by replacing existing failing septic system drain fields installed at the camp between 1972-1993 with nitrogen reducing advanced treatment system and utilizing a drip irrigation disposal. The Arizona Department of Environmental Quality completed a Total Maximum Daily Load (TMDL) study on the upper Tonto Creek and Christopher Creek area in June of 2004.The study noted human sewage as one of the major contributors to the non-point source pollution of these affected waters. The project will improve water quality by reducing the pollutants entering the stream.

Graham County
Noland Ranch
The Gila River Box Conservation Area Livestock Deterrent Fence
$136,900

The Gila River Box Conservation Area Livestock Deterrent Fence calls for the re-construction of the fence line on the entire southwestern border of Turtle Mountain Allotment. This fence separates three BLM Allotments and serves as the most effective deterrent for livestock entering the Bonita and Gila River Box National Conservation Areas. Due to the age of the fence the current condition is very poor and is non-effective in deterring of livestock. This project will affect the entire Bonita Creek and Gila River Box Conservation Area by restricting the entrance of livestock. Limiting the access of livestock into the river bottoms will benefit water quality for those living downstream.

Maricopa County
City of Phoenix Human Services Department
Sustainable Design for the Southwest Family Services Center – Pervious Concrete Demonstration Project to Mitigate Storm Water Pollution.
$251,400

This Southwest Family Services Center “Green-Build” project hopes to demonstrate a pervious concrete parking lot can mitigate storm water runoff pollution endemic to the area. The project site lies in a rapidly changing urbanized area of Phoenix, up gradient of the Salt River, Tres Rios Constructed Wetlands, and ultimately the Gila River confluence. At the same time the parking lot mitigates storm water borne pollution, the site will also demonstrate reduced micro-climate urban heat island effects and airborne dust pollution.

Water Quality Improvement Education Grants
In FY08, ADEQ created and executed a grant cycle for water quality improvement projects with a strong educational focus. Eighteen Education Grant applications were received, nine of which were awarded funding. Of those nine, three were determined to be impacting areas with a completed TMDL or WBP. Appendix C lists the projects awarded in FY 08. Appendix D lists current Water Quality Improvement Grant projects funded by open NPS Project grants. The following are the Education grants awarded in Cycle 10 that will implement or educate the public on BMPs that are addressed in either a TMDL or WBP.

Education Projects in Impaired Waters

Coconino
Oak Creek Canyon Water Quality Improvement Program
Pender Engineering
$53,490

This project will initiate a Trailhead Ambassador program for high school students. Once trained, Trailhead Ambassadors will work weekends and holiday weekends, 35 weekends from March to October, to greet visitors in Oak Creek Canyon day-use and overnight-use areas, explaining to visitors the risks associated with fecal contamination, reminding visitors of the importance of proper disposal of trash and human and pet wastes, and directing visitors attention to locations of toilets, trash receptacles, recycling receptacles and dog waste stations. This program will provide up to one high school credit towards graduation upon completion of 120 hours of volunteer service.

The grantee will also install and maintain eight Barco® Dog Waste Disposal Stations at trailheads to educate recreational users about the importance of preventing the pollution that results from human and pet wastes. This project is a collaboration with Oak Creek Canyon Task Force.

Graham
Gila Valley Best Management Practices on Crop Land
Gila Valley NRCD
$12,880

Project will 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. Due to shallow soils in the Gila Valley and the required slopes they attribute, excess irrigation water is a common occurrence. Any water that is not taken into the soil is returned to the Gila River. 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. Producers and the public will be educated through various classroom and hands-on workshops, news articles, publications, informative brochures, mailings, and field visits to view practices being implemented. Technical support will be provided by the Natural Resource Conservation Service.

Yavapai
From Education to Action in the Granite Creek Watershed
Prescott Creeks Preservation Association
$67,875.50

The purpose of this grant is to promote an awareness of water quality issues, promote behavioral changes, and to lead to pollutant load reductions to Granite Creek and Watson Lake - the impaired surface waters. This educational effort will strengthen other existing and future efforts to implement on-the-ground water quality improvement projects. Education will include: identification and assemblage of a watershed stakeholder group to participate in the Watershed Implementation Plan (WIP) process; volunteer training through workshops to actively care for water quality with hands-on, in-the-field training; design and construction of a trailer-mounted, mobile, interactive watershed model; development and distribution of a *Creek Care Guide*; and presentations to community and civic organization to discuss water quality issues and recruit potential volunteers for future on-the-ground projects.

Supported by Watershed Based Plans

On-the-Ground

Greenlee County
Coronado Resource and Conservation Development Area
Eagle Creek Watershed Restoration-Double Circles Ranch Phase III
$92,294

The Eagle Creek Watershed in northern Greenlee County is 161,172 acres of grazing land primarily leased from the U.S. Forest Service. The ranchers in the area have been working together for the past several years to implement practices on a landscape scale that will improve water quality in Upper and Lower Eagle Creek. This project will install fencing to exclude cattle from Eagle Creek and Sheep's Spring. Implementation of this grant supports a rest-rotation grazing system to distribute grazing across the watershed, reduce damage from trespass cattle and support habitat for critical species.

Gila County
Tonto Rim Christian Camp
Tonto Rim Christian Camp Water Quality Improvement Grant
$260,000

To protect and preserve the ground water quality in Tonto Creek by replacing existing failing septic system drain fields installed at the camp between 1972-1993 with nitrogen reducing advanced treatment system and utilizing a drip irrigation disposal. The Arizona Department of Environmental Quality completed a Total Maximum Daily Load (TMDL) study on the upper Tonto Creek and Christopher Creek area in June of 2004.The study noted human sewage as one of the major contributors to the non-point source pollution

of these affected waters. The project will improve water quality by reducing the pollutants entering the stream.

Mohave County
Hualapai Tribe
Sediment Reduction into Diamond Creek and the Colorado River, Grand Canyon
$35,000

Sediment erosion occurs when vehicles cross and drive down Diamond Creek to get to the Colorado River for rafting trips. It is estimated that over 2,400 vehicles used this road in the year 2007, with increasing numbers expected for the years to come. This grant will be used to channel and divert the creek from the road and construct check dams where appropriate to alleviate the erosion of sediment into Diamond Creek and the Colorado River. Water quality and macroinvertebrate communities will be monitored and education efforts will be directed to drivers and visitors to the river.

Navajo County
White Mountain Apache Tribe
White Mountain Apache Tribe's Water Quality Improvement Grant
$250,000

The main goal of this project is to rehabilitate and restore the water quality that has been degraded by frequent flooding and land erosion from the 2002 Rodeo-Chediski Fire. The Rodeo-Chediski considered the most severe wildfire in Southwest history, occurred mainly on the federally-recognized Fort Apache Indian Reservation in east-central Arizona. Several watersheds on the northwestern side of the homeland of the White Mountain Apache Tribe were severely burned including Canyon, Willow, Salt, and Cibecue Creeks. The impacts of the burn area are still affecting the west-end reservation community of Cibecue in the form of flooding in Cibecue Creek that flows through the central valley area of the community with an approximate population of 2,000 out of the total tribal population of 15,000. This grant will mitigate the damage to the land and water and will address the importance of water quality and its beneficial uses for the reservation communities.

Yavapai County
Henry Dahlberg Foundation (Mingus Springs Outdoor Learning Center)
Ash Creek Watershed Improvement Project
$32,289

Mingus Springs Outdoor Learning Center is located near the headwaters of Ash Creek on the Upper Agua Fria watershed. Water quality is threatened by a planned timber sale, increased traffic on the roads (up to 100 logging trucks a week), illegal off-road use and increased prescribed burning. This project implements best management strategies to mitigate these threats to water quality.

Maricopa County
City of Phoenix Human Services Department
Sustainable Design for the Southwest Family Services Center – Pervious Concrete Demonstration Project to Mitigate Storm Water Pollution.
$251,400

This Southwest Family Services Center "Green-Build" project hopes to demonstrate a pervious concrete parking lot can mitigate storm water runoff pollution endemic to the area. The project site lies in a rapidly changing urbanized area of Phoenix, up gradient of the Salt River, Tres Rios Constructed Wetlands, and ultimately the Gila River confluence. At the same time the parking lot mitigates storm water borne pollution, the site will also demonstrate reduced micro-climate urban heat island effects and airborne dust pollution.

Education Grants

Oak Creek Canyon Water Quality Improvement Program
Pender Engineering
$53,490

This project will initiate a Trailhead Ambassador program for high school students. Once trained, Trailhead Ambassadors will work weekends and holiday weekends, 35 weekends from March to October, to greet visitors in Oak Creek Canyon day-use and overnight-use areas, explaining to visitors the risks associated with fecal contamination, reminding visitors of the stream of the importance of proper disposal of trash and human and pet wastes, and directing visitors' attention to locations of toilets, trash receptacles, recycling receptacles and dog waste stations. This program will provide up to one high school credit towards graduation upon completion of 120 hours of volunteer service.

The grantee will also install and maintain eight Barco® Dog Waste Disposal Stations at trailheads to educate recreational users about the importance of preventing the pollution that results from human and pet wastes. This project is a collaboration with Oak Creek Canyon Task Force.

The Upper Gila Watershed Steward Program
Gila Watershed Partnership
$35,550

The Upper Gila Watershed Steward Program is an education project that will enhance the Master Watershed Steward program. This will lead to the development of targeted water quality improvement projects in the impaired waters in the Upper Gila Watershed, and ultimately to the removal of these waters from the 303(d) list.

From Education to Action in the Granite Creek Watershed
Prescott Creeks Preservation Association
$67,875.50

The purpose of this grant is to promote an awareness of water quality issues, promote behavioral changes, and to lead to pollutant load reductions to Granite Creek and Watson Lake - the impaired surface waters. This educational effort will strengthen other existing and future efforts to implement on-the-ground water quality improvement projects. Education will include: identification and assemblage of a watershed stakeholder group to participate in the Watershed Implementation Plan (WIP) process; volunteer training through workshops to actively care for water quality with hands-on, in-the-field training; design and construction of a trailer-mounted, mobile, interactive watershed model; development and distribution of a *Creek Care Guide*; and presentations to community and civic organization to discuss water quality issues and recruit potential volunteers for future on-the-ground projects.

319 Project Monitoring

Each project funded by the Water Quality Improvement Grant 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 points, vegetative transects, and/or actual water quality monitoring. Information on reductions in nonpoint source pollutant loads are tracked and reported in EPA's Grants Reporting and Tracking System (GRTS). Starting in FY08 all projects that deal with nitrogen, phosphorus, or sediment are required under the grant agreements to supply ADEQ with load reduction data on a periodic basis.

Load Reductions

ADEQ understands the importance of quantifying load reductions on a watershed, waterbody, and project level. However, quantifiable proof of nonpoint source load reduction estimates are difficult to obtain. Per Arizona statute, ADEQ will review the status of each water where a TMDL study has been performed, at least once every five years to determine if compliance with applicable surface water quality standards has been achieved.

ADEQ is currently conducting effectiveness monitoring activities on a variety of projects. Several mine remediation projects have been completed in recent years along Alum Gulch (including Humboldt Canyon), Turkey Creek, Pinto Creek, and the Hassayampa River. Changes in land use practices and improvements in riparian vegetation have occurred along the LCR and upper Nutrioso Creek which should reduce the amount of sediment delivered to the waterbodies. Upgrades to septic systems have been completed along Tonto and Christopher Creeks potentially reducing the nitrogen and *E. coli* loads. Data collection and analysis continues on all of these projects.

At a project level, ADEQ is required to enter estimated load reductions for all 319 funded projects in EPA's Grant Reporting and Tracking System (GRTS) database.

Information and load reduction data is uploaded as it is received from grantees. There are many challenges to this requirement as nonpoint source load reductions are difficult to quantify due to the natural variability and the difficulty in precisely predicting the performance of management measures or BMPs over time. Model projections are used for measuring load reductions in water quality improvement grant projects.

Chapter 6

Successful Implementation Projects

Prescott Creeks Preservation Association

Prescott Creeks is a Prescott, Arizona-based not-for-profit organization with the mission to promote, protect and celebrate the ecological integrity of riparian systems and associated wetlands in the central Arizona watersheds through conservation, restoration and education. Prescott Creeks has developed an ecosystem-wide plan to improve water flow issues, as well as water quality and wildlife habitat within the Watson Woods Riparian Preserve. This effort is expected to benefit the Verde River Watershed by restoring natural stream processes and floodplain function, maintaining flows, slowing storm water runoff, and reducing stream bank erosion in the areas of Granite Creek and Watson Lake.

Since 2006, the Water Quality Improvement Grant Program has awarded Prescott Creeks with a total of $868,110 in 319(h) funding, spread over three grant cycles and four interrelated grant projects.

The Projects

The first grant awarded to Prescott Creeks, the *Granite Creek Watershed - Water Quality Improvement and Monitoring Program*, was in the amount of $ 217,982. The project consisted of four major components: 1) redesign and construct a stormwater runoff basin, 2) apply labeling to storm drains informing the public of the consequences of dumping waste down the drain, 3) develop BMP for ranchers/community along a riparian area, and 4) monitor for metals and bacteria to assess water quality improvement.

In FY07 (Cycle 9), Prescott Creeks was awarded two separate Water Quality Improvement Grants to extend best management practice implementation, monitoring, and education further throughout the Granite Creek watershed**.** *Granite Creek Watershed - Water Quality Improvement Project Phase II* was awarded $99,062 to implement water quality improvements to the area directly downstream from the redesigned and reconstructed storm water detention basin addressed in Phase I. The overall goal is to restore the stability of the Granite Creek stream channel while maintaining natural dynamic stream processes: proper hydrologic conditions and functions, stream morphology and channel characteristics, and floodplain functions - all resulting in water quality improvements for Granite Creek and Watson Lake.

The second Cycle 9 project, *Watson Woods Riparian Preserve - Restoration Project Phase I*, was awarded $483,191. This project will result in direct benefits to two impaired water bodies through on-the-ground implementation of numerous best management practices, community involvement and education, as well as project performance monitoring.

In FY08's new Water Quality Improvement Education Grant cycle, Prescott Creeks received $67,875 for educational efforts to reduce pollution to Granite Creek and Watson Lake. The association will use the funds to train volunteers on best management practices to reduce pollution, and will design and build an interactive, trailer-mounted traveling model of how watersheds drain, how pollution reaches the water, and how human behavior effects water quality.

Outcomes

Prior to reconstruction of the stormwater basin, erosion had made three cuts 15 feet high and up to a 100 feet long. The sediment was being transported into Granite Creek and Watson Lake. Additionally the storm waters were not slowed or filtered as they moved through the basin. After reconstruction, the basin is capable of handling much larger storm events and has not given any indication that erosion will be a problem. It was designed to contain a storm event from the 473 acres of contributing watershed with an estimated 400 cfs. The 200 trees and 80 pounds of grass seed that were used in planting the project will help to filter the roadway contaminants from the storm water. The outcome of the stormwater basin redesign and rebuild is a functioning basin that slows, filters, and routes flows appropriately to the next phase of the project which will eventually include wetlands downstream.

Public involvement in the stormwater basin re-vegetation and monitoring was an important component to finishing the project and has continued to provide far-reaching educational benefits. All of the groups of volunteers that were involved in various phases of the project have reported back that they are continuing to keep an eye on "their project" and learned enough that they are spreading the word (about the importance of water quality, stormwater control, and native vegetation).

Interpretive signs at the basin site are an attractive component that provides ongoing educational outreach to the approximately 12,000 people who recreate at the project area every month.

The storm drain markers are extremely popular with the public. Designing the markers with the help of a student art contest and making the design area-specific and attractive has been an important part of the public outreach. Additional public outreach through the newspaper articles and the library display were significant to increasing public awareness. Since the markers application, Prescott Creeks has received a significant increase in contact from the public when there is a perceived problem with the creeks. These calls have included reports of various large debris, paint, unknown chemical substances, and even illicit dumping. The markers are a key part of calling attention to the waterways and improving water quality.

To date the reconstructed stormwater basin has slowed flows from the 473 acre watershed that runs into the basin. With the successful planting of native grasses and trees, the basin is filtering roadway pollutants prior to entering Granite Creek and Watson Lake, which are both listed as impaired waterways by ADEQ and the EPA. Prescott Creeks has been able to monitor throughout the watershed and in a variety of conditions to help determine potential sources of bacteria and nutrient contamination, as

well as to see the positive effects of functioning wetlands. Trends show higher rates of *E. Coli* during over-land flows and in certain areas of the watershed. In the creeks in the areas having higher readings, the indication is that the main contributing sources are human. Future DNA typing will help to make a final determination.

Red Rock Watershed Phase II

Project History

In 2002, several ranchers in the Canelo Hills watershed began working together to identify watershed issues, share science and rangeland management knowledge, work more effectively with agencies and develop projects that would address those issues. About 95% of the Red Rock Canyon Watershed is contained in five grazing allotments administered by the Coronado National Forest. These allotments are integral components of four independent ranches, the C6, Vaca, Open Cross and Red Rock. Improving water quality in Red Rock Canyon was identified as the highest priority on these ranches. In 2005, this group partnered with Coronado RC&D and several other like-minded groups to implement a water quality improvement plan. An ADEQ Water Quality Improvement Grant (Phase I) was awarded in April 2005 to implement Best Management Practices that would improve vegetative cover on the watershed. This project (Phase II) was a continuation of that project, implementing additional livestock water and fencing systems that support a rest-rotation grazing system. In addition to the ADEQ grant awarded, other funds were obtained from the Arizona Department of Agriculture and the Western Regional Sustainable Agriculture program to meet watershed goals.

Project Outcome

This project was designed to support practices implemented in Phase 1 and improve water quality in Red Rock Canyon by reducing the amount of sediment generated on the 25,000 acre watershed and transported to the stream. The Vaca and C6 Ranches were the two involved in Phase II. Four miles of fencing were installed to eliminate trespass livestock grazing that was causing erosion at the top of the watershed. In addition, 21,000 linear feet of livestock pipeline was buried, protecting it from vandalism, insuring that the ranches will be able to disperse grazing and manage vegetation.

During the 3 year project period (both phases) the watershed has shown improvement. Beginning in the second year, Red Rock Creek has run clear during summer rains whereas prior the runoff would be cloudy with sediment. Diversity of the riparian vegetation has improved as well. There is now deer grass,

willow, and a variety of trees not previously present.

The Final Report was submitted to ADEQ at the end of June. This project proved to be very successful and is a positive example for other watersheds.

APPENDIX A

Goal: Support ground and surface water quality monitoring that provides data for assessments, identification of impaired waters, TMDLs, and effectiveness of remediation and protection strategies.			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
Perform surface and ground water quality monitoring throughout the state. **Progress Summary** – Surface water – The ambient stream and lakes monitoring programs monitored per the applicable sampling plan. Focus in FY08 for the streams program was in the Salt and Verde basins. The Clean Lakes Program focused on the same basins as the streams program and ongoing TMDL studies. Ground water basin monitoring – Staff shortages limited ground water sampling and report preparation; however, sampling of the Bill Williams basin is 75% complete and sampling for the McMullen is also 75% complete. Reports for the Pinal AMA and Hualapai Valley basins have been completed, published and placed on the ADEQ website. In addition, the draft Agua Fria report should be available this fall.	Surface Water Section	Yearly	100%
Determine water quality improvements and BMP effectiveness through project monitoring and oversight. **Progress Summary –** Staff continues to provide oversight on 319(h) funded implementation projects and input and track water quality improvements in GRTS. Staff has also developed verification methods to incorporate into new and previous or existing projects to help determine success. Grantees (project managers) are required to submit to ADEQ an evaluation with specific measurements of the project success or failure. These evaluations are required for both on-the-ground and educational grants.	Grant and Outreach Unit	Ongoing	90%

Goal: Support ground and surface water quality monitoring that provides data for assessments, identification of impaired waters, TMDLs, and effectiveness of remediation and protection strategies.			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
Develop narrative implementation procedures and utilize narrative standards, as well as numeric water quality standards, to assess Arizona's waters. **Progress Summery-** Progress continues on all narrative standard implementation procedures except the narrative toxics standard IP. ADEQ developed draft water quality standards rules and final draft versions of the implementation procedures guidance documents for the narrative bottom deposits standard, narrative nutrient standard for lakes and reservoirs, antidegredation, and biocriteria for wadeable perennial streams in 2007. Revisions to water quality standards rules will be proposed as a part of the ongoing Triennial Review of surface water quality standards. ADEQ published a Notice of Proposed Rulemaking for the surface water quality standards in April, 2008. ADEQ anticipates that final revisions to the surface water quality standards will be completed by December, 2008. Proposal of implementation procedures for the narrative toxic standard has fallen behind schedule and will require a separate stakeholder effort due to complexity of the issues. The toxics implementation procedures will not be included in the 2007 Triennial Review.	Surface Water Section	June 2007	80%
Develop, initiate, and support a Volunteer Monitoring Program. **Progress Summary** – Volunteer monitoring can provide data for determining the effectiveness of water quality improvement projects. Volunteer monitoring can also serve in identifying the need for future water quality improvement projects by quantitatively and qualitatively measuring conditions in a watershed. ADEQ has worked closely with volunteer groups to develop monitoring plans and provide adequate training to make certain that monitoring procedures produce credible data.	Surface Water Section	Support Ongoing	100%

Goal: Support ground and surface water quality monitoring that provides data for assessments, identification of impaired waters, TMDLs, and effectiveness of remediation and protection strategies.			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
In order to use the data, ADEQ must ensure that the volunteer groups can produce Quality Assurance Plans (QAPs) and Sampling and Analysis Plans (SAPs) for their sampling projects. ADEQ has worked with volunteer groups during the planning phase of a monitoring project and has created a manual to assist in the development of effective monitoring plans. ADEQ supports the concept of properly trained volunteers and will continue working towards this goal as staffing and resources allow. Unfortunately, to date ADEQ has not been successful in establishing a full-time position dedicated to implementation of a monitoring program.			

Goal: Identify and quantify water quality problems in Arizona.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Support watershed rotation based monitoring program to provide water quality data on long-term monitoring stations and watershed characterization sites within the 10 surface watersheds. **Progress Summary –** Staff completed monitoring in the Salt and Verde basins in FY08.	Surface Water Section	Yearly	100%
Complete *Arizona's Integrated 305(b) Water Quality Assessment and 303(d) Listing Report* due April 1, 2004, 2006, and 2008. **Progress Summary –** As a result of both the 2002 and 2004 assessments, staff began stakeholder effort to explore revisions to the Impaired Water Identification Rule (IWIR) in June, 2004. Key issues include revisions to the binomial approach and assessment of chronics and bacteria. Changes should result in fewer federal additions to Arizona's 303(d) Lists. Changes to the IWIR are expected to be proposed in 2008. For the 2006 integrated assessment, staff has also been working on two major projects: the loading of non-ADEQ data into the surface water database and the creation of Phase 2 of an assessment calculator (AZAC or Arizona Assessment Calculator) that will begin to automate portions of the assessment process and make it more efficient. The 2006 report was delayed due to these projects, with a draft going out for public review and comment in March 2007. The final should be submitted to EPA by winter of 2008.	Standards and Assessment Unit	April 1, 2004 April 1, 2006 April 1, 2008	100% 90% 0%

Goal: Identify and quantify water quality problems in Arizona.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Complete 205(j) Report in 2005 and 2007. **Progress Summary –** *Arizona's Integrated 305(b) Assessment and 303(d) Listing Report* submitted to EPA in September 2004 provided a current assessment of water quality in Arizona; therefore, ADEQ did not prepare a 2005 205(j) report. The 2006 integrated assessment and listing report will include an assessment of all readily available data collected between January 1, 2000 and December 31, 2005. As it will be completed in late 2007, it will provide water quality status information for 2007.	Standards and Assessment Unit	April 1, 2005 April 1, 2007	N/A (see summary) N/A (see summary)
Complete watershed characterizations for at least three watersheds in Arizona (Bill Williams, Upper Gila, and Verde) by January 2004. **Progress Summary –** Watershed Based Plans are completed the Bill Williams, Upper Gila, Verde River, and Little Colorado River Watersheds, as well as the Upper Agua Fria and Middle and Lower San Pedro sub-watersheds. Modeling of watershed response to land use change has been included within the Watershed Characterization & Classification Reports, now referred to as Watershed-based Plans, for each of these watersheds. Sub-watershed areas have been ranked based on susceptibility to nonpoint source pollutant contribution to water quality degradation, and stakeholders have been identified for these priority sub-watersheds. The characterizations and reports can be viewd on-line at www.arizonanemo.org. Further watershed-based plans are currently being developed for the Salt, Santa Cruz, and Middle Gila watersheds. These watershed plans will be final in November 2008.	Surface Water Section & Grants and Outreach Unit	October 2004	100% 100% 100%

Goal: Develop TMDLs for 303(d) listed waterbodies.			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
Develop TMDLs. **Progress Summary –** Several TMDLs are near completion, including the Alamo Lake, Lake Mary Regional, and Parker Canyon Lake mercury TMDLs. These mercury TMDLs have been delayed due to two main issues; adoption of the fish tissue standard and determining the watershed natural background mercury concentrations. For Pinto Creek, a site specific standard (SSS) for dissolved copper at 42µg/L is being proposed and is hardness independent. The SSS is included in the Triennial Review of Water Quality Standards rules package and final submittal of the TMDL can not occur until the rule is adopted. Sampling to determine the Mule Gulch SSS has been completed and the data has been submitted to the modeling contractor. Modeling is anticipated to be completed by the Fall. Significant progress has been made on the upper Gila River, Parker Canyon Lake, and Lyman Lake TMDL projects.	TMDL Unit	Yearly	85%
Hold public meetings to involve local and affected stakeholders. **Progress Summary –** Stakeholder meetings were held during the last year for Parker Canyon Lake and the Lake Mary Regional TMDLs.	TMDL Unit	Yearly	100%
Receive and evaluate comments. **Progress Summary –** ADEQ did not receive any TMDL development comments in FY08. However, extensive comments were received related to the proposed site specific standard	TMDL Unit	Yearly	100%

Goal: Develop TMDLs for 303(d) listed waterbodies.			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
for Pinto Creek. These comments were addressed as part of the Triennial Review process.			

Goal: Develop and Implement Water Quality Improvement Plans			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
Write TMDL implementation plans. **Progress Summary –** Little progress was made on writing TMDL implementation plans. New staff came on board and changing priorities slowed development. Additionally the TMDL and Grants unit explored the possibility of "direct to implementation" methods and spent considerable time determining how TIPs could and should be included in this approach. Discussions are ongoing.	TMDL Unit	Yearly	85%

Goal: Develop and Implement Water Quality Improvement Plans			
Milestone & Progress Summary	**Project or Program**	**Completion Date**	**%Complete**
Write and develop Watershed-based Plans (WBP) for all ten Arizona watersheds. **Progress Summary –** Water quality improvement plans are vital components to ensure Arizona's lakes, rivers, and streams achieve applicable water quality standards. ADEQ contracts with Arizona NEMO to develop watershed-based plans for Arizona's ten major ten-digit-hydrologic unit code (HUC) watersheds. Watershed Based Plans have been completed and are online for the Bill Williams, Upper Gila, Verde River, Little Colorado River Watersheds, Upper Agua Fria, Middle and Lower San Pedro sub-watersheds, Santa Cruz, Salt, and Middle Gila Watershed. The Plans can be viewed on-line at www.arizonanemo.org. Further watershed-based plans are currently being developed for the Colorado-Lower Gila, Colorado-Grand Canyon, San Juan and San Pedro. Arizona's 10 major watersheds will be supported by final plans by 2010.	Grant and Outreach Unit	Ongoing	100% 100% 40%
Hold public meetings with stakeholders. **Progress Summary –** During each TMDL public meeting, implementation plans are discussed. The TMDL watershed coordinator attends approximately 4 watershed meetings a month relaying information about TMDLs, TIPs and grant funding.	TMDL Unit	Yearly	100%
Receive and evaluate comments. **Progress Summary –** No TIP related comments were received in FY 08	TMDL Unit	Ongoing	NA

Goal: Focus Section 319 incremental grant funds and non-federal matching resources on priority watersheds with impaired waters.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Coordinate and conduct annual meetings to set internal goals for priority funding. **Progress Summary –** The Unit met several times throughout the year to coordinate and set internal goals. Again during FY 07 it was determined that the following types of projects would score higher (i.e. priority funding): projects which include activities identified in a watershed-based plan or TMDL implementation plan; projects proposed to improve impaired or not attaining waters; or projects proposed with estimated load reductions (projected quantitative measures of success). Potential projects submitted in January 2007 were given preference based on these priorities. The Unit has also been in close contact with the EPA Project Officer to obtain feedback and recommendations on goals.	Grant and Outreach Unit	Yearly	100%
Conduct statewide grant workshops annually. **Progress Summary –** Six grant workshops were held around the state from November 27 through December 4, 2007 in preparation for the 2007-2008 Grant Cycle (Cycle 10). Attendance increased by approximately 23% compared to FY 07 (from 61 attendees to 79). Surveys filled out by workshop attendees demonstrated high satisfaction levels with all aspects of the workshops. Cycle 10 workshops were more interactive than in the past, with workbooks to help attendees generate and elaborate on ideas for 319(h) projects. The workbooks were very well received by workshop attendees. Additionally, one workshop was held in Phoenix to familiarize the public with the new Education grant	Grant and Outreach Unit	Yearly	100%

Goal: Focus Section 319 incremental grant funds and non-federal matching resources on priority watersheds with impaired waters.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Award Section 319(h) grant money each year to implement water quality improvement projects on impaired waterbodies. **Progress Summary –** During Grant Cycle 10, ADEQ received nineteen grant applications, one of which was ineligible due to the lack of an on-the-ground component. Of the nine projects awarded in June 2008, three will address water quality improvements in impaired waters. All three of these projects are located in areas that have a completed TMDL. Attachment B lists the on-the-ground projects awarded in FY 08. Attachment C lists current Water Quality Improvement Grant projects funded by open NPS Project grants. In FY08, ADEQ created and executed a grant cycle for water quality improvement projects with a strong educational focus. Eighteen Education Grant applications were received, nine of which were awarded funding. Of those nine, three were determined to be impacting areas with a completed TMDL or WBP. Appendix C lists the Education grants awarded in Cycle 10 that will implement or educate the public on BMPs that are addressed in either a TMDL or WBP.	Grant and Outreach Unit	Yearly	100%

Goal: Effectively and efficiently use financial resources and leverage funds with other programs to target nonpoint source pollution priority issues and areas.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Use the Grants Reporting Tracking System (GRTS) to track grant funding and effectiveness. **Progress Summary –** All projects awarded in FY 07 were added to the GRTS tracking system in order to track funding. ADEQ continues to learn more about entering data to track project effectiveness and will increase these efforts in FY 09. ADEQ met EPA's deadline to submit load reduction data for FY 08.	Grant and Outreach Unit	Ongoing	90%
Coordinate with other funding programs (i.e. Arizona Water Protection Fund, Water Infrastructure Finance Authority, Environmental Quality Incentives Program) to leverage money to target nonpoint source pollution management in priority areas. **Progress Summary –** ADEQ continues to build relationships with other funding programs that could be used to leverage money to target nonpoint source pollution. Due to grant cycle timeline, leveraging funds with other funding programs has proved difficult. ADEQ has met with the Arizona Water Protection Fund and the Water Infrastructure Finance Authority of Arizona to discuss how we can collaborate efforts in the future. ADEQ has had numerous grant awards with matching funds from Arizona Department of Agriculture and the Arizona Department of Transportation. ADEQ will continue to have these discussions with other funding programs to target priority areas.	Grant and Outreach Unit	Ongoing	100%

Goal: Work with and provide technical support to Arizona watershed partnerships.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Actively involve the community, including watershed partnerships, with the development of watershed-based plans and TMDL implementation plans. **Progress Summary –** Through the TMDL stakeholder meetings and watershed partnerships, ADEQ continues to work with communities in the state. Watershed-based plans have been developed though the work of NEMO. NEMO provides technical support to the groups by providing them with detailed watershed maps, technical plans, and data interpretation. By participating in watershed partnership meetings, ADEQ is able to stay connected to the community's environmental needs and concerns.	TMDL Unit and the Grant and Outreach Unit	Ongoing	100%
Provide support to community watershed partnerships. **Progress Summary –** Whenever a partnership needs ADEQ's technical assistance or support, we make it a priority to meet their needs. During the year staff attended numerous meetings to discuss watershed-based plans, impaired waters, TMDL studies, implementation plans, and the Grants Program. ADEQ's strong partnerships with University of Arizona's Master Watershed Steward and NEMO programs have enabled the department to better assist the watershed groups. The coordinators of these programs have enhanced the Grants Program and watershed partnerships statewide by providing education, maps, and technical assistance.	TMDL Unit and the Grant and Outreach Unit	Ongoing	100%

Goal: Work with and provide technical support to Arizona watershed partnerships.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Assist with the development and implementation of the Master Watershed Stewardship Program. **Progress Summary –** The Master Watershed Stewardship Program offers county-based classes for educating people about local watershed issues. The goals of the Master Watershed Steward Program are to create a network of motivated volunteers to tackle watershed issues, enhance critical thinking and critical observation skills in the target audience, facilitate collaboration among citizens, watershed groups, and natural science managers, and enhance public knowledge of watershed issues throughout the state. The Master Watershed Steward Program has completed the tasks outlined in the FY06-08 contract and has successfully secured funding from FY08-FY10. The expansion of the program was funded through a competitive education grant opportunity.	Grant and Outreach Unit and TMDL Unit	Ongoing	100%

Goal: Provide statewide nonpoint source pollution education and outreach.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Plan, develop and implement a strategy to conduct education/outreach efforts to increase public awareness of nonpoint source pollution impacts to surface and ground water resources. **Progress Summary –** The Grant and Outreach Unit participated in and funded education/outreach efforts to increase the public's awareness of nonpoint source pollution impacts to surface and groundwater resources. Some examples of education events are: Verde River Days, World Water Monitoring Day, Water Expo, Earth Day at the Phoenix Zoo, and the Tres Rios Nature Festival. Upper Management and Agency Outreach groups have helped the education/outreach efforts of the unit by attending events on behalf of ADEQ.	Grant and Outreach Unit	Plan Completion September 2003 Strategy Implemented Ongoing	100% 100%
Update web site information to reflect current activities. **Progress Summary –** All web site information is up to date and reflects the current activities for the WQD. Please visit ADEQ's Water Quality Division's homepage at www.azdeq.gov/environ/water/index.html for information on watershed management, monitoring, and assessments (click topic on left hand panel).	Surface Water Section	July 2004	100%

Goal: Develop, implement, and evaluate nonpoint source pollution management measures and other pollution prevention strategies to minimize degradation and protect surface water and groundwater quality.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Develop BMP guidance documents for nonpoint source pollution categories, including sediment, mining, and nutrients. **Progress Summary –** Through partnership with NEMO, ADEQ has developed BMP guidance documents for managing sediment, metals, nutrients, and selenium. A great deal of progress was made during FY 08. BMP documents for soil erosion and urban runoff/stormwater were developed. Irrigation practices (agriculture), livestock grazing, riparian areas, onsite septic systems, mining and abandoned mine land, forestry, and recreation BMP documents have also been developed. Included on the NEMO web site are case studies or examples of successful mitigation projects and links to other BMP materials, both of which are highly beneficial to the public and water resource managers The NEMO web site, www.arizonanemo.org, is updated on a regular basis.	Grant and Outreach Unit	October 2008	100%

Goal: Develop, implement, and evaluate nonpoint source pollution management measures and other pollution prevention strategies to minimize degradation and protect surface water and groundwater quality.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Research and identify ways to quantify load reductions as required in *EPA's 2003 Nonpoint Source Program Guidance*. **Progress Summary –** ADEQ continues to research and identify ways to quantify load reductions. On NEMO's web site under "Links to Other BMP Information" there is information for the calculation of load reductions. Water resource professionals and the public can view and download (for example) the Michigan Department of Environmental Quality's 1999 manual on calculating and documenting pollutant reductions. In FY08, all projects aimed at reducing nitrogen, phosphorus, or sediment were required to submit yearly load reduction reports to the WQIGP. The purpose of these reports is to track reductions not only based on the overall project duration, but on an annual basis. Grantees were provided with the STEPL program that will enable them to input variables specific to their projects to model pollutant load reductions. The WQIGP will determine if this strategy is effective by FY09.	Grant and Outreach Unit	June 2006	100%

Goal: Develop, implement, and evaluate nonpoint source pollution management measures and other pollution prevention strategies to minimize degradation and protect surface water and groundwater quality.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Document BMP effectiveness from water quality improvement projects in GRTS and guidance documents. **Progress Summary –** 319(h) funded water quality improvement projects must include an effectiveness evaluation component that measures the effectiveness of each improvement. Staff continues to provide technical oversight. Short-term measurable or estimated water quality improvements in sediment, nitrogen, and phosphorus and BMP effectiveness are tracked in GRTS. In addition, staff has recently initiated a program to evaluate the long-term impact of funded projects. Through Grant Effectiveness Evaluations ADEQ looks at maintenance issues, long-term effectiveness, issues that arose during and after the project period, and other aspects of the project to determine BMP effectiveness and recommend improvements in the grant process.	Grant and Outreach Unit	Ongoing	90%

Goal: Maintain / expand partnerships & cooperative opportunities with stakeholders, other agencies, organizations, and citizens.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Coordinate with federal land management agencies on water quality and watershed improvements as needed. **Progress Summary –** Staff continues to work with various federal land managers, such as USFS and BLM, to address nonpoint source pollutant impacts to water quality. Coordination with state and federal land managers is obtained through various watershed partnerships, TMDL public meetings, surface water monitoring and collaboration on water quality improvement projects.	TMDL Unit and the Grant and Outreach Unit	Ongoing	100%
Oversee and update as needed, all Memorandum of Understandings (MOUs) so that state, federal, tribes, and local resource management agencies have identified responsibilities in carrying out portions of Arizona's Nonpoint Source State Management Plan. **Progress Summary –** MOUs are updated as needed. The MOU between the USFS and ADEQ was updated in FY08. MOUs are working well in carrying out portions of Arizona's Nonpoint Source Management Plan. MOUs are updated as needed and will be reviewed over the next two years. New MOUs will be drafted to replace existing MOUs to carry out new portions of the FY08-2013 Nonpoint Source 5 Year Management Plan. ADEQ plans to reevaluate current MOUs in order to determine their necessity.	TMDL Unit and the Grant and Outreach Unit	When needed	100%

Goal: Maintain / expand partnerships & cooperative opportunities with stakeholders, other agencies, organizations, and citizens.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Coordinate meetings and updates with other state, federal, tribal, and local partners in the state (i.e., Arizona Department of Water Resources, Arizona Game and Fish Department, Bureau of Reclamation). **Progress Summary –** Staff continues to work with various watershed partnerships and state and federal land managers to address nonpoint source pollutant impacts to water quality. After five years, the established watershed groups have evolved and expanded enough so that ADEQ has had less of a coordinating role with the key players. ADEQ sends technical staff, liaison and NEMO to annual meetings: including various statewide watershed partnerships, the U.S. Forest Service, and other meetings (i.e., TMDL meetings).	TMDL Unit and the Grant and Outreach Unit	Yearly	100%

Goal: Maintain / expand partnerships & cooperative opportunities with stakeholders, other agencies, organizations, and citizens.			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Provide leadership, technical assistance, expertise and support to outside planning and governmental entities to support watershed planning and 208 regional water quality management planning. **Progress Summary –** Leadership, technical assistance, and expertise were provided throughout the year to planners and governmental entities in support of a regional wastewater planning approach. During the year, staff continued to update the 208 application forms which require applicants or permit writers to provide pertinent information to the program to make the consistency review process more efficient. WQD Data Management and Analysis Section provided technical support to complete the mapping of service and planning areas, as well as the locations of all WWTPs within the state. 208 staff continues to utilize GIS maps in the review of permit applications and amendments to determine existing facilities in the area, and to work with adjacent municipalities and private utilities to better manage water quality planning. GIS map information will be provided to local and regional entities by request.	Surface Water Section: Permits Unit	Yearly	100% 45%

Goal: Complete Nonpoint Source Annual Report			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Write and develop a Nonpoint Source Annual Report summarizing the goals and accomplishments yearly. **Progress Summary –** This Nonpoint Source Annual Report was developed to summarize the goals and accomplishments of the Nonpoint Source Program from July 1, 2007 – June 30, 2008 (FY 08).	Grant and Outreach Unit	September 30 each year	100%
Use annual reports to gauge progress on five year Plan. **Progress Summary –** The Nonpoint Source Annual Report provides the status in accomplishing both the short-term and long-term milestones identified in the Nonpoint Source Management Plan. The tasks and deliverables scheduled as part of the work plan are designed to attain our long-term goal of implementing a dynamic and effective Nonpoint Source Program designed to achieve and maintain beneficial uses of water.	Surface Water Section and Grants and Outreach Unit	Yearly	100%

Goal: Review and assess the goals and objectives of the Nonpoint Source Management Plan and revise the Plan as appropriate			
Milestone	**Project or Program**	**Completion Date**	**%Complete**
Amend Nonpoint Source Management Plan as necessary. **Progress Summary –** The Unit has been in routine contact with the EPA Project Officer to obtain feedback and recommendations on goals for the program. The plan is due for revision in FY09 and staff will work to make those revisions in a timely manner.	Surface Water Section and Grants and Outreach Unit	Ongoing	100%

APPENDIX B

Awarded Water Quality Improvement Grant Projects 2007-2008 Grant Cycle 10

Graham County
Noland Ranch
The Gila River Box Conservation Area Livestock Deterrent Fence
$136,900

The Gila River Box Conservation Area Livestock Deterrent Fence calls for the re-construction of the fence line on the entire south western border of Turtle Mountain Allotment. This fence separates three BLM Allotments and serves as the most effective deterrent for livestock entering the Bonita and Gila River Box National Conservation Areas. Due to the age of the fence the current condition is very poor and is non-effective in deterring of livestock. This project will affect the entire Bonita Creek & Gila River Box Conservation Area by restricting the entrance of livestock. Limiting the access of livestock into the river bottoms will benefit water quality for those living downstream.

Greenlee County
Coronado Resource and Conservation Development Area
Eagle Creek Watershed Restoration-Double Circles Ranch Phase III
$92,294

The Eagle Creek Watershed in northern Greenlee County is 161,172 acres of grazing land primarily leased from the U.S. Forest Service. The ranchers in the area have been working together for the past several years to implement practices on a landscape scale that will improve water quality in Upper and Lower Eagle Creek. This project will install fencing to exclude cattle from Eagle Creek and Sheep's Spring. Implementation of this grant supports a rest-rotation grazing system to distribute grazing across the watershed, reduce damage from trespass cattle and support habitat for critical species.

Gila County
Tonto Rim Christian Camp
Tonto Rim Christian Camp Water Quality Improvement Grant
$260,000

To protect and preserve the ground water quality in Tonto Creek by replacing existing failing septic system drain fields installed at the camp between 1972-1993 with nitrogen reducing advanced treatment system and utilizing a drip irrigation disposal. The Arizona Department of Environmental Quality completed a Total Maximum Daily Load (TMDL) study on the upper Tonto Creek and Christopher Creek area in June of 2004.The study noted human sewage as one of the major contributors to the non-point source pollution of these affected waters. The project will improve water quality by reducing the pollutants entering the stream.

Maricopa County
City of Phoenix Human Services Department
Sustainable Design for the Southwest Family Services Center – Pervious Concrete Demonstration Project to Mitigate Storm Water Pollution.
$260,000

This Southwest Family Services Center "Green-Build" project hopes to demonstrate a pervious concrete parking lot can mitigate storm water runoff pollution endemic to the area. The project site lies in a rapidly changing urbanized area of Phoenix, up gradient of the Salt River, Tres Rios Constructed Wetlands, and ultimately the Gila River confluence. At the same time the parking lot mitigates storm water borne pollution, the site will also demonstrate reduced micro-climate urban heat island effects and airborne dust pollution.

Mohave County
Hualapai Tribe
Sediment Reduction into Diamond Creek and the Colorado River, Grand Canyon
$35,000

Sediment erosion occurs when vehicles cross and drive down Diamond Creek to get to the Colorado River to take out or drop off for rafting trips. It is estimated that over 2,400 vehicles used this road in the year 2007, with increasing numbers expected for the years to come. This grant will be used to channel and divert the creek from the road and construct check dams where appropriate to alleviate the erosion of sediment into Diamond Creek and the Colorado River. Water quality and macroinvertebrate communities will be monitored and education efforts will be directed to visitors.

Navajo County
White Mountain Apache Tribe
White Mountain Apache Tribe's Water Quality Improvement Grant
$260,000

The main goal of this project is to rehabilitate and restore the water quality that has been degraded by frequent flooding and land erosion from the 2002 Rodeo-Chediski Fire. The Rodeo-Chediski, considered the most severe wildfire in Southwest history, occurred mainly on the federally-recognized Fort Apache Indian Reservation in east-central Arizona. Several watersheds on the northwestern side of the homeland of the White Mountain Apache Tribe were severely burned including Canyon, Willow, Salt, and Cibecue Creeks. The impacts of the burn area are still affecting the west-end reservation community of Cibecue in the form of flooding in Cibecue Creek that flows through the central valley area of the community with an approximate population of 2,000 out of the total tribal population of 15,000. This grant will mitigate the damage to the land and water and address the importance of water quality and its beneficial uses for the reservation communities.

Santa Cruz County
USDA Forest Service
Mesquital Fence and Pipeline
$13,000

This project provides implementation of best management practices including improved grazing management, 1-mile of riparian/pasture fence in the Santa Cruz-Rio Magdalena-Rio Sonoita Watershed in the borderlands area of southern Arizona. The focus is on the ephemeral Sycamore and Providencia Canyons which flow into the Santa Cruz River. This project is part of a much larger watershed based effort which seeks to enhance water quality through improved grazing management at a landscape-scale level covering nearly 35,000 acres on the west side of the Patagonia Mountains.

Yavapai County
Yavapai County Flood Control
The Pioneer Park Stormwater Quality Improvement Plan
$369,271

This water quality improvement demonstration project at Pioneer Park will protect the site's major unnamed watercourse which discharges into Granite Creek and ultimately into the Verde River in the Upper Verde Watershed, through implementation of numerous best management practices, public education, outreach, and partnership as well as performance monitoring. Pioneer Park, a regional multi-use recreational complex is comprised of 996.43 acres, is a major contributor of hydrocarbon pollutants and sediments due to urban runoff and habitat degradation. This project will not only remove pollutants from Pioneer Park watercourse, it will recharge the Prescott aquifer with clean water. The EPA has designated Yavapai County as a phase II, MS4 community due to population growth, density of population and the potential of being a major contributor to the degradation of our streams and rivers.

Henry Dahlberg Foundation (Mingus Springs Outdoor Learning Center)
Ash Creek Watershed Improvement Project
$32,289

Mingus Springs Outdoor Learning Center is located near the headwaters of Ash Creek on the Upper Agua Fria watershed. Water quality is threatened by a planned timber sale, increased traffic on the roads (up to 100 logging trucks a week), illegal off-road use and increased prescribed burning. This project implements best management strategies to mitigate these threats to water quality.

APPENDIX C

Awarded Water Quality Improvement Education Grants 2007-2008 Grant Cycle 10

Coconino
Oak Creek Canyon Water Quality Improvement Program
Pender Engineering
$53,490

This project will initiate a Trailhead Ambassador program for high school students. Once trained, Trailhead Ambassadors will work weekends and holiday weekends, 35 weekends from March to October, to greet visitors in Oak Creek Canyon day-use and overnight-use areas, explaining to visitors the risks associated with fecal contamination, reminding visitors of the stream of the importance of proper disposal of trash and human and pet wastes, and directing visitors' attention to locations of toilets, trash receptacles, recycling receptacles and dog waste stations. This program will provide up to one high school credit towards graduation upon completion of 120 hours of volunteer service.

The grantee will also install and maintain eight Barco® Dog Waste Disposal Stations at trailheads to educate recreational users about the importance of preventing the pollution that results from human and pet wastes. This project is a collaboration with Oak Creek Canyon Task Force.

Graham
Gila Valley Best Management Practices on Crop Land
Gila Valley NRCD
$12,880

Project will 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. Due to shallow soils in the Gila Valley and the required slopes they attribute, excess irrigation water is a common occurrence. Any water that is not taken into the soil is returned to the Gila River. 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. Producers and the public will be educated through various classroom and hands-on workshops, news articles, publications, and informative brochures, mailings, field visits to view practices being implemented. Technical support will be provided by the Natural Resource Conservation Service.

The Dzil Nchaa Si'an /Mt. Graham Youth Practicum Education Grant Project
Gila Watershed Partnership
$8,050

The Dzil Nchaa Si'An Youth Practicum Education Project will educate Native American youth in environmental issues and water quality impairments in the Upper Gila Watershed. Funds will be used to develop a summer camp that would include environmental and cultural activities. During the five-day practicum, tribal students will be encouraged to pursue professional natural resource careers, raise their ecological awareness, exemplify traditional connection to the earth, and enjoy the outdoors. The Dzil Nchaa Si'An Youth Practicum Education Project will build relationships between the Coronado Forest and Native American youth and provide for long-term collaboration to benefit the youth, their elders, their tribes, the land, and water quality.

The Upper Gila Watershed Steward Program
Gila Watershed Partnership
$35,550

The Upper Gila Watershed Steward Program is an education project that will enhance the Master Watershed Steward program. This will lead to the development of targeted water quality improvement projects in the impaired waters in the Upper Gila Watershed, and ultimately to the removal of these waters from the 303(d) list.

Maricopa
Stormwater Pollution Prevention in YOUR Neighborhood
City of Peoria
$5,000

An important element of a successful stormwater program is to enhance public awareness and understanding of stormwater pollution prevention issues which includes non-point source contamination. This is accomplished through a dedicated education plan. This grant project is to develop a stormwater pollution prevention education program for Peoria students in grades K -8. The education program will be titled "Stormwater Pollution Prevention in Your Neighborhood." The focus of the program is a hands-on, interactive stormwater model that allows the students to see the effects of non-point contaminants. The goal of the program is to educate the students on stormwater pollution prevention issues and identify positive behaviors that will enhance our environment on a long term basis.

Water's Changing Journey
Audubon Arizona
$168,442

The objectives of *Water's Changing Journey* include informing participants of the NPS pollution problem, educating them so that they may make changes in their personal behaviors, as detailed below, that improve local water quality and motivating them to participate in community cleanup projects. Located at the Nina Mason Pulliam Rio Salado Audubon Center on the banks of the Salt River just a mile south of downtown Phoenix, the project will focus on providing environmental education to the communities of South and Central Phoenix. The *Water's Changing Journey* project will consist of three education approaches:

1) A walk through the Center's approximately two-acre wetland area – the Water Journey Path. The walk will be guided by interpretive signage and supplemental printed material.
2) The opportunity for visitors to check out a 'water quality backpack' to complete self-guided activities along the Water Journey Path.
3) A formal two-hour naturalist or trained volunteer led program that focuses on water quality, the NPS problem and water monitoring activities.

Pima
Creating a Neighborhood Model to Address Urban Stormwater Pollution
Watershed Management Group
$103,240.22

This project will educate urban residents on nonpoint source pollutants and will train them in the implementation of BMPs to improve water quality in High School Wash in Tucson. The focus will be on BMPs designed to reduce stormwater runoff, erosion, and the transport of nonpoint source pollutants into the wash. A core group of five community leaders will be trained as educators in BMP design, monitoring, and maintenance. The project will also include wash clean-up efforts, outreach workshops to highlight project success, and the publication of a neighborhood guide for nonpoint source and stormwater BMPs specific to Arizona's environment.

Master Watershed Steward Program
University of Arizona
$148,336

The goal of the proposed project is to expand the focus of the Arizona Cooperative Extension's Master Watershed Steward Program (MWSP) to promote on-site water quality improvements and enhance watershed education state-wide. The current MWSP concentrates on general adult education. This proposed project will enhance the current program and extend the reach of MWSP to work with watershed partners and facilitate the implementation of watershed improvement projects. The project will be a collaborative effort between the Arizona Department of Environmental Quality (ADEQ), MWSP, Arizona Nonpoint Education for Municipal Officials Program (AZNEMO), Arizona Cooperative Extension, and various watershed partners.

Yavapai

From Education to Action in the Granite Creek Watershed
Prescott Creeks Preservation Association
$67,875.50

The purpose of this grant is to promote an awareness of water quality issues, promote behavioral changes, and to lead to pollutant load reductions to Granite Creek and Watson Lake - the impaired surface waters. This educational effort will strengthen other existing and future efforts to implement on-the-ground water quality improvement projects. Education will include: identification and assemblage of a watershed stakeholder group to participate in the Watershed Implementation Plan (WIP) process; volunteer training through workshops to actively care for water quality with hands-on, in-the-field training; design and construction of a trailer-mounted, mobile, interactive watershed model; development and distribution of a *Creek Care Guide*; and presentations to community and civic organization to discuss water quality issues and recruit potential volunteers for future on-the-ground projects.

APPENDIX D

Current Water Quality Improvement Projects Funded by Open NPS Project Grants

Project (Contract) Title	Contract No.	Contract Expiration Date	Award Amount	Funding Source
Frye Mesa Vegetative Rehabilitation	5-002	6/30/2007	$171,500	NPS XIII Inc
Overgaard Townsite	6-008	11/30/2007	$123,543	NPS XIII Base
Peterson Wash Stabilization	6-010	7/31/2007	$115,950	NPS XIII Base
West Clear Creek Tributary Watersheds	6-019	9/30/2008	$224,177	NPS XVI Base
Oak Creek Canyon Task Force Water Quality Program	6-023	12/31/2007	$131,904	NPS XIV Inc.
Compomocho-Sacaton Watershed Stormwater Runoff Control Phase II	7-002	2/28/2008	$179,800	NPS XIV Inc.
Central Detention Dam Rehabilitation	7-006	4/30/2008	$15,600	NPS XIII Base
Kaler Ranch Erosion Control Project	7-007	4/30/2008	$167,000	NPS XIII Inc. NPS XIV Strmwtr.
Partnership to Improve Water Quality in Red Rock Canyon/Upper Santa Cruz Watershed	7-008	2/28/2008	$249,302	NPS XIII Base.
CWA Manzanita Erosion Control Project	8-001	4/30/2008	$27,033	NPS XV Base
Hart Prairie Sediment Control Project	8-002	4/30/2008	$27,422	NPS XV Inc.
R-Bar-C Boy Scout Sewer Facilities Upgrade	8-003	4/30/2008	$162,300	NPS XV Base
Gibson Mine TMDL Reduction to Mineral Creek	8-004	4/30/2008	$140,171	NPS XV Base NPS XVI Base
Gila County Ground and Surface Water Improvement Project Phase II	8-005	4/30/2008	$258,300	NPS XV Base
Gila River Clean-up Project	8-006	4/30/2008	$110,500	NPS XIV Strmwtr. NPS XV Base
Upper Eagle Creek Watershed Restoration Project	8-007	4/30/2008	$360,930	NPS XVI Inc.
Kaler Ranch Erosion Control Project Phase II	8-008	4/30/2008	$169,800	NPS XIII Inc. NPS XV Inc.
Bank Stabilization at Spencer Beach	8-009	4/30/2008	$50,000	NPS XV Base
Composting Restroom for the Hualapai Helipad Tourist Destination	8-010	4/30/2008	$52,160	NPS XV Base
Watershed Approach to Improving Water Quality in Red Rock Canyon II	8-012	4/30/2008	$35,102	NPS XV Base

Granite Creek Watershed – Water Quality Improvement and Monitoring Program	8-013	4/30/2008	$217,982	NPS XV Inc.
Sediment Reduction in Whitewater Draw: A Watershed Partnership Approach	9-001	6/30/2009	$114,950	NPS XVI Base
Graham County Abandon Vehicle Removal	9-002	6/30/2008	$71,950	NPS XVII Inc.
Eagle Creek Watershed Restoration - Double Circles Ranch Phase I	9-003	6/30/2009	$95,100	NPS XVII Inc.
Gila River Water Quality Improvement- Duncan Valley	9-004	6/30/2009	$250,000	NPS XVI Base NPS XVII Base
Rainbow Lake Water Quality Enhancement	9-005	6/30/2009	$32,000	NPS XV Inc. NPS XVI Inc.
Optimizing Reclaimed Water, Groundwater and Stormwater Inputs at Tucson's Lakeside Lake	9-006	6/30/2010	$54,978	NPS XVII Inc.
Granite Creek Watershed – Water Quality Improvement and Monitoring Program Phase II	9-007	6/30/2010	$99,062	NPS XVI Inc. NPS XVII Inc.
Watson Woods Riparian Preserve Restoration Project	9-008	6/30/2010	$483,191	NPS XVI Inc.
U of A – Master Watershed Stewardship Program	EV04-0013	06/30/2006	$259,820	NPS XVI Base
2008 Canon Envirothon	EV06-0063	12/1/2008	$100,000	NPS XVI Base
Arizona State Envirothon	EV07-0028 EV07-0136	12/1/2007	$39,000	NPS XV Base NPS XVI Base NPS XVII Base
Children's Waterfest (Arizona Make a Splash with Project WET Water Festival) 2006-2008	EV07-0073	11/30/2008	$30,000 ($10,000/yr for 3 yrs.)	NPS XVI Base
U of A Non-point source Education for Municipal Officials (NEMO)	EV02-0149	11/30/2008	$235,400	NPS XV Inc. NPS XVI Base

APPENDIX E

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. Once a surface water has been listed by either ADEQ or EPA, ADEQ's 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 – 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.

- Level E – 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 F – 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.

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.

Impaired Water Improvement Tracking Table

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Bill Williams Watershed Alamo Lake	Mercury in fish (2002 by EPA) (ADEQ had it listed prior 2002)	TMDL Drafted and completed Public Review. Will delay final TMDL until fish tissue criteria are adopted. Confirming NB numbers to recalculate TMDL.	Mining, and air deposition, natural background	Completing TMDL	
LEVEL A Investigations and TMDL development	Bill Williams Watershed Alamo Lake	Ammonia (2004) pH (1996) DO (2006 draft)	To initiate in 2008 with Bill Williams River	Grazing and recreation	Proposed: Identify and prioritize nutrient sources and implement appropriate BMPs.	Lake operated by Corps of Engineers and monitoring by USFWS. Ample data to support TMDL development.
LEVEL A Investigations and TMDL development	Bill Williams Watershed Bill Williams River (from Alamo Lake to Castaneda Wash)	Ammonia (2006 draft) pH (2006 draft), DO (2006 draft)	To initiate in 2008 with Alamo Lake	Same sources as Alamo Lake nutrient impairments	Proposed: Identify and prioritize nutrient sources and implement appropriate BMPs.	See discussion for Alamo Lake nutrient impairments.
LEVEL A Investigations and TMDL development	Bill Williams Watershed Coors Lake	Mercury in fish (EPA listed in 2004)		Mining, natural background and atmospheric	Proposed: Identify and prioritize mercury sources and implement appropriate remediation. Fish advisory established but not posted.	
LEVEL A Investigations and TMDL development	Colorado - Grand Canyon Watershed Colorado River (from Lake Powell to Paria River)	Selenium (2006 draft) Suspended sediment concentration (2004 by EPA)	To initiate in 2009	Primarily natural sandstone formations, with potential contribution from recreation and grazing (SSC) Natural springs, and out of state sources (Se)	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states.	Same as Colorado reach below.

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Colorado - Grand Canyon Watershed Colorado River (from Parashant Canyon to Diamond Creek)	Selenium (2004) Suspended sediment concentration (2004)	To initiate in 2009	Primarily natural sandstone formations, with potential contribution from recreation and grazing (SSC) Natural springs, and out of state sources (Se)	Proposed: Identify source loads contributed from other states. Water quality improvement grants: 1. Kaibab Tribe Moccasin Wash range and crop BMPs (1997) 2. Pratt Tank riparian improvement 3. Milkweed riparian restoration (Hualapai) (2000) 4. Mohawk Cyn (Hualapai) 2000 5. Red Springs fencing (Hualapai) 1998 6. Bank stabilization at Spencer Beach (2007) 7. Diamond Creek road improvement (2008)	Colorado River Salinity Control Program (B of R); Lower Colorado River Basin Compact (with other states)
LEVEL A Investigations and TMDL development	Colorado - Grand Canyon Watershed Paria River (from Utah border to Colorado River)	Suspended sediment concentration (2004) *E. coli* (2006 draft)	To initiate in 2009	Primarily natural sandstone formations, with potential contribution from recreation and grazing (SSC) Natural springs, and out of state sources (Se)	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states. National Park Service collecting *E. Coli* at USGS gage station.	National Parks Service MOU
LEVEL A Investigations and TMDL development	Colorado - Grand Canyon Watershed Virgin River (from Beaver Dam Wash to Bend Wash)	Selenium (2004) Suspended sediment concentration (2004)	To initiate in 2009	Primarily natural sandstone formations, with potential contribution from recreation, grazing, and out of state sources.	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states.	
LEVEL A Investigations and TMDL development	Colorado - Lower Gila Watershed Colorado River (from Hoover Dam to Lake Mohave)	Selenium (2004)	To initiate in 2009	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.	

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Colorado - Lower Gila Watershed Colorado River (from Main Canal to Mexico)	Selenium (2006 draft) DO (2006 draft)	To initiate in 2009	Crop production, WWTP discharges, septic systems, out-of-state loads, natural springs	Proposed: Identify and prioritize sources and implement appropriate BMPs. Identify source loads contributed from other states.	California's Colorado River Basin Board has also listed this portion of the river as impaired due to selenium.
LEVEL A Investigations and TMDL development	Colorado - Lower Gila Watershed Gila River (from Coyote Wash to Fortuna Wash)	Boron (2004 relist) Selenium (2004)	To initiate in 2009	Crop production, WWTP discharges, septic systems and, natural springs	Proposed: Identify and prioritize sources and implement appropriate BMPs.	
LEVEL A Investigations and TMDL development	Colorado - Lower Gila Watershed Painted Rocks Borrow Pit Lake	DO (1992)	Will initiate when lake refills.	Urban, agriculture, grazing, roads, construction. Prior diagnostic feasibility study indicated problem due to lake management and flow. Lake is ephemeral	Diagnostic feasibility study (in 1990's) proposed operating lake in a manner that increases DO levels (e.g. higher levels).	
LEVEL A Investigations and TMDL development	Little Colorado Watershed Lyman Lake/Reservoir	Mercury in fish (2004 by EPA)	Currently monitoring	Air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate BMPs.	USFS Arizona Game and Fish Dept.
LEVEL A Investigations and TMDL development	Little Colorado Watershed Bear Canyon Lake	pH (2004 by EPA)	Initiated in 2009	Recreation or grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs.	USFS MOU
LEVEL A Investigations and TMDL development	Little Colorado Watershed Little Colorado (from Porter Tank to McDonalds Wash)	Copper (1992) Silver (1992) Suspended sediment concentration (2004 EPA, 2006 draft ADEQ)	Initiated in 2007	Unknown (metals). Grazing, roads, recreation, urban runoff (SSC)	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Little Colorado River Watershed Coordinating Council

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Little Colorado Watershed Long Lake (lower)	Mercury in fish (2004 by EPA)	Draft TMDL developed. Recalculating TMDL	Air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	Little Colorado River Watershed Coordinating Council
LEVEL A Investigations and TMDL development	Little Colorado Watershed Soldiers Lake and Soldiers Lake Annex	Mercury in fish (2004 by EPA)	Draft TMDL developed. Recalculating TMDL	Air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	Little Colorado River Watershed Coordinating Council
LEVEL A Investigations and TMDL development	Little Colorado Watershed Upper Lake Mary and Lower Lake Mary	Mercury in fish (2002 by EPA)	Draft TMDL developed. Recalculating TMDL	Primarily air deposition	Proposed: Identify and prioritize mercury sources and implement appropriate remediation.	USFS MOU City of Flagstaff
LEVEL A Investigations and TMDL development	Middle Gila Watershed Gila River (from Centennial Wash to Gillespie Dam)	Boron (2004) Selenium (2004)	To initiate in 2009	Wastewater discharges, crop production (including canal return flows), and natural spring sources	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Corps of Engineers
LEVEL A Investigations and TMDL development	Middle Gila Watershed Queen Creek (from headwaters to Potts Canyon)	Copper (2002)	TMDL drafted to be completed in Dec 2008	Historic and current mining.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Friends of Boyce Thompson Arboretum.
LEVEL A Investigations and TMDL development	Middle Gila Watershed 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)	To initiate data review in 2008	Sediment contamination during runoff in areas where these pesticides were historically used. Potentially improper disposal of banned pesticides.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	
LEVEL A Investigations and TMDL development	Salt Watershed Apache Lake, Canyon Lake, and Salt River just below Saguaro Lake	Dissolved oxygen (2004) (Added Apache in draft 2006)	To initiate in 2009	Dam operations grazing, forestry, roads, and small town urban runoff.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIGs: Trees for the Rim (after wildfire)	USFS

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Salt Watershed Crescent Lake	pH (2002 - EPA)	TMDL to be initiated in 2009	Grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs.	
LEVEL A Investigations and TMDL development	Salt Watershed 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 along Pinto Creek and its tributaries.	TMDL indicated mining sources, especially at Gibson Mine. Need to survey area to identify other abandoned mining operations and prioritize for remediation. WQIGs: Gibson Mine remediation (2006). ADEQ is attempting to set a site-specific copper standard based on natural background.	Friends of Pinto Creek
LEVEL A Investigations and TMDL development	Salt Watershed Salt River (from Pinal Creek to Roosevelt Dam)	Sediment (draft 2006)	To initiate in 2010	Grazing, forestry, roads, stream bank and channel destabilized wildfires, and mining.	Proposed: Identify and prioritize sources and implement appropriate BMPs. WQIG: Trees for the rim (wildfire)	USFS MOU
LEVEL A Investigations and TMDL development	San Pedro Watershed Mule Gulch and tributaries, including Brewery Gulch (from headwaters to Highway 80 bridge) (3 reaches)	Copper (1990) Zinc (2004 portion) Cadmium (2004 portion) pH (2004 EPA portion)	Draft TMDL being developed. Must establish site specific standard first. Modeling NB data to begin in 2008.	Current and historic mining	Completed: Phelps Dodge has re-routed stormwater and seeps to minimize impacts to Mule Gulch ADEQ is working on a site-specific copper standard based on natural background.	
LEVEL A Investigations and TMDL development	Santa Cruz Watershed Arivaca Lake	Mercury in fish (1992)	TMDL completed in 1999, included TIP.	Air deposition and natural deposition from local substrates.	TMDL sources identified: Manage lake to reduce production of methylmercury. Possibly dredge lake sediments	
LEVEL A Investigations and TMDL development	Santa Cruz Watershed Parker Canyon Lake	Mercury in fish (2004 by EPA)	TMDL being developed and should be completed by Dec. 2008.	Air deposition.	Proposed: Identify and prioritize sources and implement appropriate BMPs.	

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL A Investigations and TMDL development	Santa Cruz Watershed Rose Canyon Lake	Low pH (2004 by EPA)	May be natural low pH values (occurring 4 meters deep in this 7 acre lake.)	Wildfire damage.	Proposed: Identify, prioritize and implement appropriate nutrient BMPs.	
LEVEL A Investigations and TMDL development	Santa Cruz Watershed 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 or wastewater discharges.	Water quality improvement projects: 1. Audubon septic system improvements (2002) 2. Cattle exclosure at Audubon research (2002) 3. C6 Ranch grazing BMPs (on Redrock Canyon) (2002) 4. Redrock grazing improvements (2006)	Friends of Sonoita Creek and Friends of Santa Cruz
LEVEL A Investigations and TMDL development	Verde Watershed East Verde River (from American Gulch to Verde River)	Arsenic (2006 draft) Boron (2006 draft)	To initiate in 2008	Natural springs. WWTP discharges	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Verde Watershed Association
LEVEL A Investigations and TMDL development	Verde Watershed East Verde River (from Ellison Creek to American Gulch)	Selenium (2004)	To initiate in 2010	Natural springs. WWTP discharges	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Verde Watershed Association
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Little Colorado Watershed Little Colorado (from Silver Creek to Carr Wash)	Sediment (EPA 2004) *E. coli* (2004)	initiated in 2007	Grazing, small urban areas.	Water quality improvement grant: Silver Creek sediment reduction (1994)	Silver Creek Advisory Commission and the Show Low Creek
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Little Colorado Watershed 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.	Water quality improvement grant: Murray-Saffel Canyon sediment controls (2001)	Little Colorado River Watershed Coordinating Council

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Little Colorado Watershed Rainbow Lake	Narrative nutrient (weeds) (1992) High pH (1992)	Completed TMDL and TIP in 2000 Sampling to determine if dredging is feasible.	Primarily nutrient recycling. Area was sewered. Grazing and urban runoff may contribute.	Lake was sewered in the early 1990's. ADEQ is trying to determine if dredging would be effective. Currently provided a water quality improvement grant to install filter strips around the lake and do some monitoring.	Little Colorado River Watershed Coordinating Council and Show Low Watershed Enhancement Partnership
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed Alvord Park Lake	Ammonia (2004)	To initiate in 2008-09	Urban runoff, duck feeding or source water	Proposed: Identify and prioritize sources and implement appropriate BMPs.	City of Phoenix Parks Department Arizona Game and Fish
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed Chaparral Lake	DO (2004) *E. coli* (2004)	To initiate in 2008-09	Urban runoff, duck feeding or source water	Proposed: Identify and prioritize sources and implement appropriate BMPs.	City of Scottsdale Parks Dept. Arizona Game and Fish Dept.
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed Cortez Park Lake	DO (2004) High pH (2004)	To initiate in 2008-09	Urban runoff, duck feeding or source water	Proposed: Identify and prioritize sources and implement appropriate BMPs.	City of Phoenix Parks Department Arizona Game and Fish Dept.
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed French Gulch (from headwaters to Hassayampa River)	Copper (1994) Zinc (1994) Cadmium (1994)	Completed in 2004	Mining (primarily Zonia Mine)	Remediate mining impacts at Zonia Mine. Identify, prioritize, and implement appropriate BMPs at other mines.	
LEVEL B Develop a Watershed Improvement Plan (WIP) or other strategy to identify and prioritize water quality improvement projects	Middle Gila Watershed Gila River (from San Pedro River to Mineral Creek)	Sediment (draft 2006)	To initiate in 2009	Wildfire a few years ago. Grazing, forestry, roads, construction	Water quality improvement grants: Trees for the Rim (after wildfire)	

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed Hassayampa River (from headwaters to Copper Creek, including tributaries such as Cash Mine Creek)	Cadmium (1992) Copper (1992) Zinc (1992) Low pH (2006 draft)	TMDL Completed in 2002	Mining, including, but not limited to McCleur Mine, Senator Mine, Sheldo 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
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Salt Watershed Tonto Creek (from headwaters to unnamed tributary) and Christopher Creek (from headwaters to Tonto Creek)	*E. coli* (1998) Phosphorus (relist 2006) Low DO (EPA 2004) Nitrogen (1998)	TMDLs for nitrogen and *E. coli* were completed in 2005	Inadequate septic systems for subdivisions along streams. Grazing, fish hatchery, and horse corrals may also be contributing.	Water quality improvement grants: 1. Gila County septic system upgrades (2006) 2. R-Bar-C Boy Scout septic improvements (2007) 3. Tonto Christian Camp septic improvements (2008)	Friends of the Forest. Just establishing a new partnership -- Tonto Watershed Improvement Group (TWIG)
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	San Pedro Watershed San Pedro River (from Aravaipa Creek to Gila River)	*E. coli* (2004) Selenium (2004)	Initiated in 2006. Currently monitoring.	Grazing, mining, and stream bank or channel destabilization	Water quality Improvement Grants: 1. Arivaipa Cyn riparian restoration (2000) 2. San Pedro riparian improvements (2000) 3. Wildlife habitat restoration (2003) 4. San Pedro cleanup trash (near St David) (2003) 5. 3 Links Farm riparian restoration (2005) 6. S.P Initiative identified sediment controls in The Narrows (2000) 7. Manzanita Erosion control (2006)	
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	San Pedro Watershed San Pedro River (from Babocomari Creek to Dragoon Wash)	*E. coli* (2004)	Initiated in 2006.	Grazing, septic systems, and urban runoff in Fairbank and Benson area	Water quality improvement grants: 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 & crossing improve (2002)	

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Santa Cruz Watershed 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
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Santa Cruz Watershed Santa Cruz River (from Mexico to Nogales WWTP)	*E. coli* (2002)	Initiated in 2007	Grazing and unknown sources in Mexico.	Water quality improvement grants: 1. Santa Fe Ranch riparian area improvement (2000) 2. Riparian improvement and monitoring (2003) 3. SC River sediment control (2006) 4. Mesquital fencing (2008)	Friends of Santa Cruz
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Santa Cruz Watershed Three R Canyon (from headwaters to Sonoita Creek) and tributaries (Cox Canyon)	Beryllium (1994) Cadmium (1994) Copper (1994) Zinc (1994) Low pH (1994)	TMDL completed in 2003	Mining	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
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Upper Gila Watershed Blue River (from Strayhorse Creek to San Francisco River)	*E. coli* (2006 draft)	To initiate in 2008	Grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Upper Gila Watershed Partnership
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Upper Gila Watershed Gila River (from Bonita Creek to Yuma Wash)	*E coli* (2004) Suspended sediment concentration (2004 by EPA)	Initiated in 2006 Draft TMDL being developed.	Grazing, roads, crop production, mining, recreation	Water Quality Improvement Projects: 1. Gila River clean up (2006) 2. Gila Box fencing (2008) 3. Crop filter strips (2008)	Upper Gila Watershed Partnership

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Upper Gila Watershed Gila River (from New Mexico to Bitter Creek)	*E. coli* (draft 2006) Suspended sediment concentration (draft 2006)	Initiated in 2006 Draft TMDL eing developed.	Grazing, crop production, septic systems	Water quality improvement grant: Duncan Valley canal replacement (2007)	Upper Gila Watershed Partnership
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Upper Gila Watershed 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	TMDL identified need to upgrade septic systems and reduce loadings from grazing and construction or development. WQIGs: Luna Lake septic system upgrades (2001)	Upper Gila Watershed Partnership
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Upper Gila Watershed San Francisco (from Blue River to Limestone Gulch)	*E. coli* (2006 draft)	To initiate in 2008	Grazing or recreation. Possibly inadequate septic systems.	Water quality improvement grants: 1. Martinez Ranch riparian improve and grazing BMPs 2. Kaler Ranch erosion control (2006) 3. Cole Creek and White Mule Creek sediment reduction (2004)	Upper Gila Watershed Partnership Greenlee County Health Dept
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Verde Watershed Granite Creek (from headwaters to Willow Creek) Watson Lake (on Granite Creek)	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 public restrooms	WQIG: 1. Retention basin improvement and street sewer ed program (2007) 2. Granite Creek channel re-contouring in Watson Woods. 3. Riparian improvement in Watson Woods. Prescott Creeks (a watershed group) is also monitoring to determine sources of nutrients and *E. coli* bacteria.	Prescott Creeks.

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Verde Watershed Oak Creek (from headwaters to Spring Creek - 5 reaches) and Spring Creek (from headwaters to Oak Creek)	*E. coli* (1994 - Slide Rock portion) (2006 draft - rest of Oak Creek and Spring Creek)	Phase I TMDL completed in 1999, with a TIP. Drafted Phase II TMDL. Recalculating TMDL	Recreation, septic systems, urban runoff, grazing	Water quality improvement grants: 1.Sediment traps - Guardian Project 2000. 2. 10 Septic systems 2000-2002 3. Don't trash Slide Rock 4. Sediment catchments 2000-02 5. Slide Rock education and outreach (1997) 6. DNA Genotyping (1999) 7. Septic systems (1998) 8. Outfall pipe (2000) 9. Septic survey (2001) 10. Trailhead toilets and riparian improvements (2002) 11. Redrock State Park constructed wetland (2006)	Oak Creek Task Force
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Verde Watershed Peck's Lake	High pH (1998) Low DO (1998)	TMDL Completed in 2001, including TIP	Primarily recycling of nutrients. Watershed is tiny and not developed	TMDL sources identified: Improve riparian conditions to remove sediments that might add more nutrient loads.	Northern Arizona Audubon Society Verde Watershed Association
LEVEL B Develop plan or formal strategy that identifies and prioritizes water quality improvement projects	Middle Gila Watershed Mineral Creek (from Devils Canyon to Gila River)	Selenium (2004) Copper (1992) Low DO (draft 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 considering ways to mitigate selenium contamination and low dissolved oxygen occurring in mining tunnel constructed to direct surface water around mining operation. Water quality improvement grants - Gibson Mine remediation expected to mitigate remaining copper contamination here.	
LEVEL C Implement the plan or other strategy	Bill Williams Watershed 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, especially inactive Hillside Mine tailings piles	TMDL identified sources Remediation option still being explored. May need to identify and prioritize other mining contributions in the drainage. WQIG funds available for remediation activities.	Freeport-McMoRan BLM State Lands

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL C Implement the plan or other strategy	Middle Gila Watershed Turkey Creek (from unnamed tributary to Poland Creek)	Copper (1992) Lead (2004)	TMDL completed in 2007. ADEQ is doing effectiveness monitoring.	Historic mining	US Forest Service has remediated tailings at Golden Belt and Golden Turkey mine sites and is doing effectiveness monitoring.	
LEVEL C Implement the plan or other strategy	Bill Williams Watershed Boulder Creek (from Butte Creek to Copper Creek)	Arsenic (before 1998)	Completed TMDL in 2004 Completed TIP in 2005	Mining, especially inactive Hillside Mine tailings piles	TMDL identified sources. Remediation options being explored. May need to identify and prioritize other mining contributions in the drainage. Water quality improvement grant funds available for remediation activities.	Freeport-McMoRan BLM State Lands
LEVEL C Implement the plan or other strategy	Santa Cruz Watershed Lakeside Lake	Nitrogen (2004 EPA) Phosphorus (2004 EPA) Chlorophyll (2004 EPA), DO (2004) NH3 (2004)	TMDL completed in 2005	This lake is receiving wastewater effluent. Wildlife, duck feeding, dog droppings may contribute some nutrients.	City of Tucson is implementing treatment and practices identified in the TMDL. Increased aeration and treating water with alum to remove phosphorus from water column.	City of Tucson Park and Recreation. Arizona Game and Fish Department
LEVEL C Implement the plan or other strategy	Santa Cruz Watershed Pena Blanca Lake	Mercury in fish	TMDL completed in 1999, included TIP.	Three sources identified in TMDL: atmospheric deposition, St. Patrick Mine ball mill site, and natural substrates.	USF S removed tailings at St Patrick Mine Ball Mill site and reduced sediment to lake. USFS is planning to dredge the lake to remove mercury recycling in lake sediments.	Friends of Santa Cruz
LEVEL D EPA takes lead in mitigation efforts because pollutant sources are in Mexico	Santa Cruz Watershed Nogales Wash (from Mexico to Portrero Wash)	*E. coli* (1988) Ammonia (2004) Chlorine (1988) Copper (2004)	To initiate TMDL in 2009	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

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL E Re-evaluate listing (Improvements in the watershed and new standard)	Little Colorado Watershed Little Colorado River (from West Fork LCR to Lyman Lake) (several reaches)	Sediment/turbidity (1992)	TMDL, including TIP completed in 2002. Need to reevaluate using SSC standards, so will sample for SSC and turbidity in 2009	Grazing, recreation, silviculture (forestry), stormwater, roads, smaller urban areas. Stream bank and channel degradation.	Water quality improvement grants: 1. Coyote Creek sediment reduction (1998) 2. Big Ditch project (2000). Need to monitor to evaluate effectiveness.	US Forest Service MOU Little Colorado River Watershed Coordinating Council
LEVEL E Re-evaluate listing (new standard)	San Pedro Watershed San Pedro River (from Dragoon Wash to Tres Alamos Wash)	Nitrate (1990)	Nitrate standard is not applicable. Current triennial review proposes to drop this site-specific standard.	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)
LEVEL E Re-evaluate listing (improvements in the watershed)	Santa Cruz Watershed Alum Gulch (from headwaters to end of intermittent flow) and tributaries (e.g. Humboldt 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
LEVEL F Re-evaluate listing (new data indicates natural conditions)	Upper Gila Watershed Cave Creek (from headwaters to South Fork of Cave Creek)	Selenium (2004)	ADEQ proposing delist. New monitoring shows no exceedances.	Pristine area		Gila Watershed Partnership
LEVEL E Re-evaluate listing (improvements in the watershed and natural conditions)	Verde Watershed Stoneman Lake	Low DO (1998) High pH (1998) Narrative Nutrients	TMDL Completed in 2001, including TIP	TMDL indicated sources primarily recycling of nutrients. Septic systems have potential to add nutrients. Lake is ephemeral.	TMDL sources identified septic systems and natural conditions as primary sources of nutrients. Recommended increasing water sources for lake. Water quality improvement grants provided to replace septic systems, create grey water use systems, and construct sediment catchments.	Stoneman Lake Owners Association

EXPECTATION FOR IMPROVEMENT	WATERSHED SURFACE WATER	POLLUTANTS (Year Listed)	TMDL DEVELOPMENT	POTENTIAL SOURCES	PROJECTS AND ACTIVITIES	SUPPORT AND PARTNERSHIPS
LEVEL E Re-evaluate listing (improvements in the watershed and changes in standards)	Verde Watershed 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 for effectiveness.	Grazing, urban development, roads, etc	Water quality improvement grants: 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 (Chino) (2002) 6. Upper Verde wildlife area (2006) 7. Hart Prairie sediment control (2006).	Verde Watershed Association
LEVEL F ADEQ requests delist based on new monitoring data	Bill Williams Watershed Boulder Creek (from unnamed tributary to Copper Creek) (3 reaches)	Mercury (EPA listed in 2004)	EPA may delist based on newer samples	Mining		
LEVEL F ADEQ requests delist based on new monitoring data	Upper Gila Watershed Gila River (from Skully Creek to San Francisco River)	Selenium (2004)	ADEQ proposing delist. New monitoring data show no exceedances.	Crop production and grazing	Proposed: Identify and prioritize sources and implement appropriate BMPs.	Upper Gila Watershed Partnership
LEVEL F ADEQ requests delist based on new monitoring data	Upper Gila Watershed San Francisco (from headwaters to Mexico Border)	Sediment (2004 by EPA)	ADEQ proposing delist. New data show no exceedances.			
LEVEL F ADEQ requests delist based on new monitoring data	Verde Watershed Whitehorse Lake	DO (2004 EPA)	ADEQ proposing delist. Investigation shows that exceedances were due to natural conditions during lake turnover.			

APPENDIX F

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

Water Quality Improvement Grant Program Request for Grant Applications EV08-0025 2007-2008

The Arizona Department of Environmental Quality (ADEQ) is requesting applications for projects that implement on-the-ground water quality improvements to manage nonpoint source pollution in Arizona.

AVAILABLE FUNDING

Approximately $1.8 million is available for funding for 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.

INVESTING IN CLEAN WATER

The ultimate vision of the program is for all of Arizona's waters to be clean and safe. However, all journeys begin with small steps. To reach this vision, The Water Quality Improvement Grant Program strives to fund projects that implement sufficient, economically and scientifically sound management practices that result in quantifiable improvements to surface water quality. Other outcomes of strong projects include education and public awareness of water quality issues, active citizen involvement, innovative approaches to problem solving, and long-term project maintenance and results.

REQUIREMENTS FOR ALL INVESTMENTS

- On-the-ground implementation component
- 40% nonfederal match
- Education and outreach component with specified projected results
- Demonstrated water quality improvements

EVALUATION

Grants will be awarded based on the answers to three basic questions asked of each potential investment proposal:

- What water quality outcomes are ADEQ buying?
- What is the likelihood those outcomes will be achieved?
- Is this the best use of money?

Water Quality Improvement Grant Program
INVESTING IN CLEAN AND SAFE WATER FOR THE STATE OF ARIZONA

Publication Number: C 07-16

City	Location	Address	Date	Time
Phoenix	Burton Barr Central Library	1221 N. Central Ave. 85004	11/27/07	10 a.m. - noon
Tucson	ADEQ Southern Regional Office	400 W. Congress, Suite 433 85701	11/28/07	10 a.m. - noon
Flagstaff	ADEQ Northern Regional Office	1801 W. Route 66, Suite 117 86001	11/29/07	10 a.m. - noon
Pinetop-Lakeside	Town Hall, Council Chambers	1360 N. Niels Hansen Lane 85929	11/30/07	10 a.m. - noon
Yuma	Yuma City Hall	1 City Plaza 85364	12/3/07	1 p.m. – 3 p.m.
Kingman	Mohave County Administrative Offices	700 W. Beale Street 86402	12/4/07	1 p.m. – 3 p.m.

If you are interested in attending a grant workshop, please RSVP to Grant and Outreach Coordinator Krista Osterberg either via phone at (602) 771-4635 or, toll free, (800) 234-5677, Ext. 771-4635; or via e-mail at osterberg.krista@azdeq.gov.

Workshops with less than 5 RSVPs will be cancelled or rescheduled. We can only contact those who RSVP to reschedule workshop dates.

APPLICATION

The 2007-2008 Water Quality Improvement Grant Manual details the grant program and includes application forms and instructions on how to apply.

Extensive revisions have been made to the grant application, grant instructions and appendices. Applicants must access/download all new materials from our web page.

If you wish to have a hard copy of the grant manual and/or workbook sent to you, please call Bertha Thomas at (602) 771-4630 or, toll free, (800) 234-5677, Ext. 771-4630.

Water Quality Improvement Grant Program
INVESTING IN CLEAN AND SAFE WATER FOR THE STATE OF ARIZONA

DEADLINES

- The deadline for the optional **pre-proposal** submission is **Friday, December 14th at 3 p.m.** Staff will provide written feedback on pre-proposals by January 4, 2008. Those who submit pre-proposals will be eligible for setting up a one-on-one meeting with WQIG staff to review their submissions and feedback on either January 8th or 9th.
- The deadline for the final, completed **grant application** is Wednesday, February 13th at 3 p.m.

For both the pre-proposal and final application, submissions received by ADEQ after 3p.m. the day of the deadline will not be considered.

AWARDS

Grant awards will be announced in **May of 2008**.

APPENDIX G

ADEQ Arizona Department of Environmental Quality
Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

Water Quality Improvement Grant Program Request for Grant Applications EV07-0034 2008

The Arizona Department of Environmental Quality (ADEQ) is requesting applications for water quality education programs for the State of Arizona.

AVAILABLE FUNDING

Up to $500,000 is available for multiple awards. The distribution of these funds from the United States Environmental Protection Agency is provided pursuant to Section 319(h) of the Clean Water Act.

INVESTING IN SUCCESSFUL PROJECTS

The competitive education grant process is a new component of the Water Quality Improvement Grant Program (WQIGP). The overall goal of this program is intended to promote statewide efforts to manage nonpoint source pollution.

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

The WQIGP is committed to fund projects that result in the restoration of watersheds and improved water quality. This can be best achieved through projects that have a combination of an education component to promote behavioral changes, as well as an "on-the-ground" component where best management practices are implemented to directly reduce nonpoint source pollution to surface and ground waters. The WQIGP recognizes that through education based programs, improved water quality can be achieved. The WQIGP will invest funding in such projects for up to a two year period. To ensure that ADEQ is investing in the best education projects, a set of desired outcomes has been established. Successful projects will address all of the following criteria:

- Result in improved protection and awareness of water quality in Arizona
- Demonstrate educational benefits that are commensurate with project costs
- Self-evaluate to measure success in achieving the project's proposed outcomes
- Provide at least 40 percent of the total project costs as nonfederal match
- Support ADEQ's Water Quality Division Mission
- Comply with state and federal regulations

In addition, investment priority will be given to educational projects that achieve one or more of the following:

- Lead to pollutant load reductions to impaired surface waters or ground water, such as providing education or training for on-the-ground projects
- Result in demonstrated long-term behavioral changes
- Offer hands on, active participation, and in-the-field experiences
- Establish or strengthen local efferts to implement on-the-ground water quality improvement projects
- Implement a strategy to reduce recreational impacts
- Develop new tools for determining impairments or measuring effectiveness of on-the-ground water quality improvement projects
- Identify and prioritize critical sites where on-the-ground projects are needed to bring an impaired water to meet standards

EVALUATION

Grants will be awarded based on the answers to three basic questions asked of each potential investment:

- What are the educational benefits that ADEQ is investing in?
- What is the likelihood those outcomes will be achieved?
- Is this the best use of money?

APPLICATION

The Education Grant Application is available online and can be downloaded at www.azdeq.gov/environ/water/watershed/outreach.html. If you have any questions please contact Krista Osterberg at (602) 771-4635, or toll free, (800) 234-5677, Ext. 771-4635; or via e-mail at osterberg.krista@azdeq.gov

DEADLINES

The deadline for the grant application is March 20 at 3 p.m.
The deadline for the pre-proposal is February 28 at 3 p.m.
Pre-proposals and applications received by ADEQ after 3 p.m. the day of the deadline will not be considered.

AWARDS

Grant awards will be announced in **June of 2008**.

FOR MORE INFORMATION

Attend the Education Grant Training on February 20 from 10 a.m - 11 a.m. at ADEQ. This one hour training is designed to provide you with the tools necessary to successfully submit an education grant. Please RSVP to Krista Osterberg at (602) 771-4635 or by e-mail at osterberg.krista@azdeq.gov if you plan to attend.

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