

Work Plan Elements

The following text provides a detailed description of each Work Plan element established for the AWWQRP. Table 4 provides a summary of these Work Plan elements.

1. Research Agenda Implementation

Overview—The AWWQRP Research Agenda has been refined as part of the preparation of this revised Work Plan (see discussion above regarding how the Research Agenda was refined). This refinement will guide the development and implementation of upcoming research projects. In the future, it is expected that completion of new research projects or changes in regulatory drivers will require additional refinement of the Research Agenda.

Work Plan Activity—The AWWQRP will prepare RFQs for advertisement that support the Project's Research Agenda. In addition and if necessary, the Research Manager in collaboration with AWWQRP staff and the RWG will refine the Research Agenda.

2. Public Outreach

Overview—Public outreach has proven to be an important vehicle for sharing information regarding the AWWQRP and generating discussion on the goals and objectives of the Project. At the recommendation of the RWG, the AWWQRP has accelerated public outreach efforts, especially in 2001 and 2002. These outreach efforts have been focused on the following groups:

- Federal Agencies, e.g., Army Corps of Engineers
- State Water Quality Agencies, e.g., Colorado Water Quality Control Commission
- Scientific Organizations, e.g., American Water Resources Association
- Water Industry Organizations, e.g., Water Environment Federation
- Water Policy Organizations, e.g., Western States Water Council

Table 3 provides a list of public outreach conducted since the beginning of 2000. Most outreach efforts have ranged from formal oral presentations based on accepted abstracts to informal discussions with agency representatives. Several of these presentations have included the submission of a manuscript for publication as part of the conference proceedings.

Table 3. Outreach Conducted Since 2000

Date & Location	Audience	Presenter(s) & Affiliation
January 20, 2000 Tucson, AZ	Environmental Planning Advisory Committee, Water Quality Subcommittee, Pima Association of Governments	Karen Sierra, AWWQRP Ed Curley, AWWQRP
Spring 2000	American Fisheries Society, Water Quality Section <i>Water Quality Matters</i> newsletter article	Bob Gray, SAG Karen Sierra, AWWQRP
May 5, 2000 Mesa, AZ	Arizona Water and Pollution Control Association	Nicole Rowan, CDM
July 18, 2000 Rapid City, SD	Western States Water Council - Project and Habitat Characterization Study fact sheets provided	Ed Anton, RWG
August 25, 2000 Denver, CO	EPA Region 8 (Bruce Zander, Bill Wuerthele, Gene Reetz)	Susan Morea, CDM Nicole Rowan, CDM
Summer 2000	Water Environment Research Foundation <i>Progress</i> newsletter article	Karen Sierra, AWWQRP
September 11, 2000 Denver, CO	Rocky Mountain Water Environment Association	Susan Morea, CDM
September 18, 2000 Tucson, AZ	Sonoran Desert Conservation Plan, Science Technical Advisory Team Meeting	Linwood Smith, EPG
September 21, 2000 Tucson, AZ	Pima County Wastewater Management Advisory Committee	Karen Sierra, AWWQRP
September 22, 2000 Phoenix, AZ	Arizona Hydrological Society	Linwood Smith, EPG
October 2, 2000 Denver, CO	Colorado Water Quality Forum	Susan Morea, CDM Nicole Rowan, CDM
October 27, 2000 Portland, OR	Western Coalition of Arid States	Ed Curley, AWWQRP Richard Meyerhoff, CDM
October 30 - 31, 2000 Washington, D.C.	EPA Headquarters & WERF	Ed Curley, AWWQRP Richard Meyerhoff, CDM
October 2000 Las Vegas, NV	Las Vegas Wash Study Subcommittee	Linwood Smith, EPG
November 17, 2000 California	California Stormwater Quality Task Force	Susan Morea, CDM
February 8, 2001 Tucson, AZ	Tucson Symposium for Water	Ed Curley, AWWQRP Karen Sierra, AWWQRP
March 4 - 7, 2001 St. Louis, MO	TMDL Science Issues Conference	Nicole Rowan, CDM
March 15, 2001 Reno, NV	Western Coalition of Arid States	Ed Curley, AWWQRP Linwood Smith, EPG
March 16, 2001 Scottsdale, AZ	Western States Water Council	Ed Curley, AWWQRP Karen Sierra, AWWQRP Richard Meyerhoff, CDM Mark Murphy, URS
April 19, 2001 Tucson, AZ	Pima County Wastewater Management Advisory Committee	Karen Sierra, AWWQRP
May 3, 2001 Mesa, AZ	Arizona Water and Pollution Control Association	Ed Curley, AWWQRP Richard Meyerhoff, CDM

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Date & Location	Audience	Presenter(s) & Affiliation
		Karen Sierra, AWWQRP
May 11 - 12, 2001 Tucson, AZ	Arizona Riparian Council	Mark Murphy, URS
May 17, 2001 Tucson, AZ	Water Quality Subcommittee of Environmental Planning Advisory Committee, Pima Association of Governments	Karen Sierra, AWWQRP
June 20 - 22, 2001 San Diego, CA	Western Coalition of Arid States	Ed Curley, AWWQRP Richard Meyerhoff, CDM
July 31 – Aug 2, 2001 Fort Collins, CO	The Nature Conservancy	Jim Loftis, CSU
August 21, 2001 Phoenix, AZ	American Fisheries Society	Richard Meyerhoff, CDM Ed Curley, AWWQRP Karen Sierra, AWWQRP
October 13 - 17, 2001 Atlanta, GA	Water Environment Federation Technology Conference	Richard Meyerhoff, CDM Nicole Rowan, CDM Steve Canton, Chadwick & Associates Tim Moore, Risk Sciences
October 24 - 26, 2001 Tucson, AZ	Western Coalition of Arid States	Ed Curley, AWWQRP Karen Sierra, AWWQRP Richard Meyerhoff, CDM Mark Murphy, URS Susan Morea, CDM
November 1, 2001 Salt Lake City, UT	National Water Resources Association	Mark Pifer
November 6, 2001 Tempe, AZ	Phoenix Chapter of the Arizona Hydrology Society	Mark Murphy, URS
November 7 - 8, 2001 Tucson, AZ	Arizona Hydrological Society	Mark Murphy, URS
November 11 - 15, 2001 Baltimore, MD	Society of Environmental Toxicology and Chemistry	ENSR
November 12 - 15, 2001 Albuquerque, NM	American Water Resources Association	Mark Murphy, URS Ed Curley, AWWQRP Karen Sierra, AWWQRP Richard Meyerhoff, CDM Nicole Rowan, CDM
November 16, 2001 Santa Fe, NM	New Mexico Environment Department	Ed Curley, AWWQRP Karen Sierra, AWWQRP
November 26, 2001 Denver, CO	Colorado Water Quality Forum	Bob Gensemer, ENSR Susan Morea, CDM
December 10, 2001 Denver, CO	Colorado Water Quality Control Commission	Bob Gensemer, ENSR Susan Morea, CDM
December 12, 2001 Denver, CO	Colorado Wastewater Utilities Council	Bob Gensemer, ENSR
December 13, 2001 San Francisco, CA	American Geophysical Union	Mark Murphy, URS
February 20 - 22, 2002 Albuquerque, NM	Western Coalition of Arid States	Bob Gensemer, ENSR

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Date & Location	Audience	Presenter(s) & Affiliation
March 25, 2002 Tempe, AZ	USDA Water Conservation Laboratory	Richard Meyerhoff, CDM
April 25 - 26, 2002 Payson, AZ	Arizona Municipal Utilities Leadership Institute	Kathy Chavez, PCWWM
April 26 - 27, 2002 Wickenburg, AZ	Arizona Riparian Council	Mark Murphy, URS
May 1 - 3, 2002 Mesa, AZ	Arizona Water and Pollution Control Association	Richard Meyerhoff, CDM Mark Murphy, URS Ed Curley, AWWQRP
May 16, 2002 Tucson, AZ	Pima County Wastewater Management Advisory Committee	Karen Sierra, AWWQRP
May 20, 2002 Denver, CO	Colorado Water Quality Forum	Bob Gensemer, ENSR Susan Morea, CDM Nicole Rowan, CDM
May/June 2002	<i>Southwest Hydrology</i> magazine article	Betsy Woodhouse, editor Karen Sierra, AWWQRP
June 3 - 4, 2002 Washington, D.C.	EPA Symposium: Designating Attainable Uses for the Nation's Waters	Richard Meyerhoff, CDM Bob Gensemer, ENSR
June 19 - 21, 2002 San Diego, CA	Western Coalition of Arid States	Richard Meyerhoff, CDM Mark Murphy, URS
July, 2002	<i>Watersheds and Wet Weather</i> newsletter article	Richard Meyerhoff, CDM
September 9, 2002	Arizona Mining Association	Richard Meyerhoff, CDM
September 13, 2002	Continuing Law Education: Western Water Law	Ed Curley, AWWQRP Richard Meyerhoff, CDM

The publication of research manuscripts in peer-reviewed journals has been a goal of the AWWQRP since its inception. In May 2002, *Comparative Biochemistry and Physiology* formally accepted a manuscript stemming from the Extant Criteria Evaluation, "Evaluating the role of ion composition on the toxicity of copper to *Ceriodaphnia dubia* in very hard waters," was accepted for publication. This manuscript will be published as part of a series of papers addressing various elements of the Biotic Ligand Model.

In addition to this manuscript, other publications are either in preparation or planned, including: (1) Characteristics of effluent-dependent waters, based on the technical findings from the Habitat Characterization Study (target journal: American Water Resources Association); (2) Regulatory alternatives for effluent-dependent waters based on the findings from the Habitat Characterization Study (target journal: American Water Resources Association); and (3) Extant Criteria Evaluation Study published as a special Society of Environmental Toxicology and Chemistry (SETAC) book.

Other opportunities to share information through society or regional newsletters and publications are taken advantage of when available. For example, the AWWQRP presented findings from the

Habitat Characterization Study at the annual Water Environment Federation Technology Conference meeting in Atlanta, GA, 2001. One of the papers presented at this meeting, “An Alternative Approach to Permitting Effluent-dependent Waterbodies Is Needed,” was published as a feature article in the Water Environment Federation publication *Watershed and Wet Weather* in July 2002. The AWWQRP will continue to watch for and take advantage of such opportunities to publicize the Project and share research results.

Work Plan Activity—Under this revised Work Plan, the AWWQRP will continue its public outreach efforts. A number of outreach activities are already planned through the remainder of 2002. In addition, the AWWQRP will develop an outreach strategy to focus future efforts at sharing information. Under this strategy, the AWWQRP will develop action items to be implemented in order to enhance outreach efforts to three key groups: environmental advocacy, agricultural industry interests and state regulators. In addition, the AWWQRP will consider how to effectively disseminate Project information to arid West wastewater utilities that do not actively participate in organizations or venues where the AWWQRP routinely shares Project results, e.g., Western Coalition of Arid States.

3. AWWQRP Policy and Guidance Documents

Overview—As the AWWQRP matures, the need for developing AWWQRP policy and guidance documents has become necessary. Such documents will help ensure that Project activities are carried out in a consistent manner and provide a foundation for the intent, purpose and meaning of research results.

Work Plan Activity—Three documents are planned under this Work Plan:

- *AWWQRP Glossary* – The definitions of commonly used terms associated with arid West waters need to be established to provide certainty with regards to communicating Project results. Examples of such terms include ephemeral, intermittent and perennial. Accordingly, the AWWQRP Research Manager will develop a glossary of commonly used terms. This glossary will be subject to review by Project participants including the SAG and RWG.
- *Publication, Presentation and Style Guide* – The AWWQRP Program and Research Managers will prepare a AWWQRP policy document that establishes research publication, presentation and style policies. Experience gained from the Habitat Characterization and Extant Criteria Evaluation studies has identified the need to establish consistent methods and processes for disseminating research results. Adherence to these policies will become part of future AWWQRP research contracts. At a minimum, this document will address the following issues:
 - Ownership of Research Materials – set policies regarding the use of research products developed by contractors under an AWWQRP contract.

- Publication – establish publication responsibilities of contractors including designation of authorship, responsibility/requirements for AWWQRP review of manuscripts, acknowledgement of AWWQRP/EPA funding and peer review and responsibilities of costs associated with publication, e.g., page charges and purchase of reprints.
 - Style/Format of Research Reports – Establish style reference manual for Project reports and minimum requirements for printed and electronic versions of final reports.
 - Project Citation – Establish format for citation of AWWQRP documents.
 - Dissemination of information procedures – Establish policies for use of AWWQRP materials for presentation at professional and public meetings.
- *AWWQRP Funds Management*—Cooperative research funding opportunities may be available to the AWWQRP in the future. Examples of such opportunities could include cooperatively funding research projects with organizations such as WERF or receiving research funds from wastewater utilities to conduct research on a specific topic. To be prepared to support these potential opportunities, the AWWQRP will establish funds management procedures that are consistent with EPA and Pima County procurement procedures.

4. Research Collaboration

Overview—Water quality research is not unique to the AWWQRP. Organizations, e.g., WERF and federal agencies, e.g., the EPA and Army Corps of Engineers, routinely conduct research on various elements of water quality from generating empirical data for establishment of national ambient water quality criteria to developing methods for implementing programs to control pollutants. While the idea of conducting water quality research is not unique, the focus of the AWWQRP on conducting water quality research activities on ephemeral and effluent-dependent waters is unique.

One means to maximize the benefit of expenditures on research is to implement research activities jointly with other entities – with and without sharing of funds. For example, since 2000 the AWWQRP has been developing a relationship with WERF to discuss opportunities to conduct research on topics of similar interest. The potential exists for the AWWQRP to bring an arid West perspective to a WERF project by contributing funds or staff time. Other organizations have also indicated an interest in working cooperatively with the AWWQRP on common goals. For example, the Los Alamos National Laboratory (Laboratory) routinely researches water quality issues in the ephemeral, intermittent and effluent dependent waters associated with the Laboratory. Laboratory personnel have indicated an interest in working cooperatively, primarily through information sharing. As the AWWQRP matures, the opportunity and demand for cooperative relationships – both financial and time-related – are expected to grow. Many of these cooperative relationships may be beneficial to furthering the purpose of the Project.

Work Plan Activity—The AWWQRP will support collaborative efforts where there is a clear relationship to the Project's purpose. Many of these efforts will require only the time of the Research Manager and AWWQRP staff; however, expenditures of time on these efforts are

subject to the approval of the AWWQRP Project Director. If the collaborative effort involves the transfer of funds from or to the AWWQRP, these funds will be managed according to the procedures established by the AWWQRP (see Work Plan Element 3).

5. Research Implementation

Overview—The completion of research projects results in additional information that can be used in a regulatory context. While individual projects may discuss results in a regulatory context, e.g., Habitat Characterization Study, the results of these individual projects should be linked together in a manner that is useful to regulators. The linking of this information is best suited to implementation or guidance document(s) that are applicable to arid West streams, e.g., ephemeral or effluent-dependent streams.

Work Plan Activity—The Research Manager, in collaboration with the AWWQRP staff and RWG, will prepare implementation document(s) to provide a mechanism to disseminate research results to regulators. The audience for these documents includes not only state and tribal water quality regulators, but federal agencies involved in the regulation of water quality and implementation of Clean Water Act programs in the West, including among others the EPA, U.S. Fish & Wildlife Service, Army Corps of Engineers, U.S. Forest Service and Bureau of Land Management. The content of these documents is unknown at this time, but could include elements such as refinement of designated uses, establishment of water quality criteria, and guidance on the assessment of water quality data for Clean Water Act Sections 305(b) and 303(d).

6. Research Continuation

Overview—To date, research conducted under this Project has focused on developing an understanding of effluent-dependent waters (e.g., where are they, how have they developed, what are their physical, chemical and biological attributes?). Additional AWWQRP research is ongoing to develop an understanding of the link between existing national water quality criteria and protection of aquatic communities of effluent-dependent waters. These projects have shown that the need for continued research in ephemeral and effluent-dependent waters is great.

The AWWQRP was originally established as a five-year program with \$5,000,000 in funding (PL 103-327). An additional \$500,000 was authorized in 2001 (PL 107-73), which is administered under a separate grant. As suggested above, the questions of habitat or ecosystem science transcend single objective, individual grants. There is an enormous need for long-term monitoring of the hydrology and ecology of effluent-dependent streams. Because flow within arid West watersheds is so variable, to fully investigate ecosystem questions in some streams may require many more years of ecological monitoring than their non-arid equivalents. Implementing long-term monitoring studies requires secure funding over many seasons or years, the kind of support afforded other regional research programs, e.g., research conducted by the U.S. Department of Agricultural Experimental Ranges and Forests in other parts of the West.

Work Plan Activity—As part of its public outreach effort, the AWWQRP will look for opportunities to establish a source of long term funding that will allow not only the funding of long-term projects to monitor arid West ecosystems, but allow the development of a long-term research strategy that looks beyond the current end of the Project. Having a secure funding source will allow the AWWQRP to conduct long-term planning and consider the development of long-term cooperative relationships with other research entities or facilities.

Table 4. Summary of Work Plan Elements

No.	Work Plan Element	Work Plan Activities
1	Research Agenda Implementation	<ul style="list-style-type: none"> ▪ Implement new research that supports Research Agenda ▪ Refine Research Agenda, as appropriate
2	Public Outreach	<ul style="list-style-type: none"> ▪ Continue to disseminate Project results to regulatory agencies and industry and scientific organizations ▪ Develop strategy to enhance outreach to the following groups: environmental advocacy, agricultural industry and state regulatory agencies ▪ Evaluate how to effectively disseminate Project information to wastewater utilities that do not actively participate in organizations where AWWQRP routinely shares Project results
3	AWWQRP Policy and Guidance Documents	<p>Prepare the following policy or guidance documents:</p> <ul style="list-style-type: none"> ▪ AWWQRP Glossary – develop glossary of commonly used arid West water terms ▪ Publication, Presentation and Style Guide ▪ Collaborative Research Management Policy
4	Research Collaboration	<ul style="list-style-type: none"> ▪ Collaborate with other research efforts or organizations that share a common purpose with the AWWQRP
5	Research Implementation	<ul style="list-style-type: none"> ▪ Prepare implementation document(s) to provide mechanism to disseminate Project results to regulators
6	Research Continuation	<ul style="list-style-type: none"> ▪ Conduct activities or respond to opportunities to establish long-term funding source(s) for the AWWQRP