

V. LIST OF PREPARERS

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Major contributors to the environmental impact statement for the CAP Regulatory Storage Division (Central Arizona Water Control Study) were as follows:

Under contract to the Bureau of Reclamation, Dames & Moore and its subcontractors, including Battelle Institute (Columbus Division), Archaeological Research Services Inc., and Arizona State University, performed the environmental and social impact assessments for the CAWCS and conducted public involvement activities from July 1979 to December 1982. Dames & Moore, et al., prepared drafts of the EIS prior to December 1982.

The U.S. Bureau of Reclamation conducted CAWCS studies of economic-financial impacts and developed engineering designs and estimates for the alternatives, as well as supervising the work of all consultants. Reclamation reviewed drafts of the EIS prepared by Dames & Moore, and prepared the Draft EIS after the completion of Dames & Moore's contract in December 1982.

The U.S. Army Corps of Engineers conducted the hydrology studies for the CAWCS, developed analyses of flood damages and flood reduction benefits, and conducted studies of nonstructural flood damage reduction alternatives. The Corps did not participate in the preparation of the EIS.

Individuals involved in EIS preparation and review, or who contributed substantially to preparation of supporting documents and impact analyses, are listed in Table V-1.

Table V-1
LIST OF PREPARERS

Name	Firm	Qualifications	Participation
James E. Ayres	Archaeological Research Services, Inc.	M.A. Anthropology, 17 years experience, formerly Arizona State Historic Preservation Officer and Arizona State Museum staff.	Associate Principal Investigator, Historic Cultural Resources.
Richard G. Bauman	U.S. Bureau of Reclamation	B.S. Wildlife Biology, 10 years experience in natural resource protection and wildlife management, Wildlife Biologist.	HEP team member, Biology technical reviewer.
James E. Burton	Arizona Game & Fish Department	B.S. Fisheries Biology, 6 years experience, Habitat Evaluation Specialist.	HEP team member.
Thomas G. Burbey	U.S. Bureau of Reclamation	B.S. Civil Engineering, 21 years experience in water resource planning and project operations.	Technical reviewer for water quality and water resources.
Glenn R. Cass	Dames & Moore	B.S. Architectural Engineering, 8 years experience, Project Engineer, P.E.	Principal Investigator, Acoustics.
Randy Chandler	U.S. Bureau of Reclamation	B.S. Civil Engineering, 4 years experience, Hydraulic Engineer.	Computer programmer for water supply analysis.
Barbara A. Conrad	Dames & Moore	B.S. Zoology, M.S. Botany, 7 years experience, Certified Associate Ecologist, Ecological Society of America (ESA).	Associate Principal Investigator, Biological Resources.
Joe Dixon	U.S. Army Corps of Engineers	B.S. Geological Engineering, M.S. Sanitary Engineering, 12 years experience in planning and water resources development.	Corps of Engineers Study Manager.
Debra A. Duerr	Dames & Moore	B.A. Urban Affairs, 7 years experience in environmental planning, assessment, and regulation.	EIS Coordinator.
Bruce D. Ellis	U.S. Bureau of Reclamation	B.A. Anthropology, 5 years experience, Environmental Specialist.	Technical reviewer.
Carol Erwin	U.S. Bureau of Reclamation	B.S. Engineering, 9 years experience, Planner.	Team Leader for non-structural flood control analysis.
Wendy Espeland	Consultant	B.A., M.A. Sociology, Ph.D. candidate Sociology, 4 years experience in social assessment.	Principal Investigator, Social Resources.
Kenneth E. Evans	Dames & Moore	B.S. Mathematics/Physics, 10 years experience in meteorology.	Principal Investigator, Air Quality.

Table V-1 (continued)

Name	Firm	Qualifications	Participation
James W. Furlow	Dames & Moore	B.S., M.S. Geology, 16 years experience, Senior Geologist.	Principal Investigator, Geology/Soils.
Jennifer Fowler	U.S. Fish & Wildlife Service	B.S. Natural Resources Conservation, .S. Wildlife Science, 8 years experience, Fish & Wildlife Biologist.	HEP team leader.
Chris Gehlker	U.S. Bureau of Reclamation	B.A. Economics, 9 years experience, Economist.	Principal Investigator, Economics.
George J. Geiser	Dames & Moore	B.S. Civil Engineering, 5 years experience in water resources engineering, P.E.	Principal Investigator, Water Quality.
Don Gross	U.S. Army Corps of Engineers	B.S. Civil Engineering, 10 years experience in water resources planning, EIT.	Project Engineer for flood control.
R. Jan Henley	Dames & Moore	M.S. Resource Economics, 17 years experience in socio-economic assessment.	Principal Investigator, Future-Without-the-Project.
Timothy J. Henley	U.S. Bureau of Reclamation	B.S. Civil Engineering, 7 years experience, Civil Engineer, P.E.	CAWCS Study Manager.
Rick Johnson	U.S. Bureau of Reclamation	B.S. Civil Engineering, 3 years experience, Civil Engineer, EIT.	CAWCS Project Engineer.
Joseph J. Kreutz	U.S. Bureau of Reclamation	B.S. Civil Engineering, 23 years experience, Supervisory Civil Engineer, P.E.	Engineer for Plans and Estimates.
Stephen V. Magnussen	U.S. Bureau of Reclamation	B.S. Civil Engineering, 21 years experience in water resources planning.	Technical and policy reviewer.
Eileen Marrinan	U.S. Army Corps of Engineers	B.A. Geography and Environmental Science, 5 years experience, Supervisory Outdoor Recreation Planner.	Team Leader for recreation planning.
Richard L. Maze	Dames & Moore	M.S. Biology, 10 years experience, Senior Biologist, Certified Senior Ecologist (ESA), Certified Wildlife Biologist (Wildlife Society).	Principal Investigator, Biological Resources, HEP team member.
Bob Michaels	U.S. Bureau of Reclamation	B.S. Forestry, M.S., Ph.D. Outdoor Recreation Planning, 11 years experience, Natural Resource Specialist.	Technical reviewer for recreation.
Larry D. Morton	U.S. Bureau of Reclamation	B.S. Engineering, 20 years experience, Civil Engineer, Environmental Engineer.	Technical and policy reviewer.
Rachel Most	Arizona State University	B.A., M.A., Ph.D. candidate, Anthropology, 6 years experience, Assistant Director, Office of Cultural Resource Management.	Associate Principal Investigator, Prehistoric Cultural Resources.
Barbara H. Murphy	Dames & Moore	B.A. Geology, 6 years experience, Certified Professional Geological Scientist (AIPG).	Associate Principal Investigator, Geology/Soils.

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Name	Firm	Qualifications	Participation
Glen Rice	Arizona State University	B.A., M.A., Ph.D, Anthropology, 10 years experience, Director Office of Cultural Resource Management.	Principal Investigator, Prehistoric Cultural Resources.
Cynthia A. Richmond	Battelle Institute	M.C.R.P. City and Regional Planning, 5 years experience in environmental impact assessment and recreation planning.	Principal Investigator, Recreation and Aesthetics.
Allen E. Rogge	U.S. Bureau of Reclamation	Ph.D. Anthropology, 8 years experience, Archaeologist.	Technical reviewer for cultural resources.
Martha A. Rozelle	Dames & Moore	Ph.D. Community Management and Education, 12 year experience in public participation.	CAWCS Public Involvement Coordinator.
Deborah A. Saint	U.S. Bureau of Reclamation	B.A. Geography, 10 years experience, Social Factors Analyst	Technical reviewer for social assessment.
Carolyn M. Slatt	Consultant	B.A. Education, 10 years experience in technical writing.	Technical Writer.
Harry Smail	Battelle Institute	M.S. Natural Resources, M.C.R.P., 9 years experience, Land Use Planner, AICP.	Principal Investigator, Land Resources.
Larry Soehlig	U.S. Forest Service, Tonto National Forest	B.S. Forestry, 24 years experience, Lands and Minerals Staff Officer.	Tonto National Forest Coordinator for wildlife biology, recreation, and archaeology.
Lyle Stone	Archaeological Research Services, Inc.	Ph.D. Anthropology, 17 years experience in historical archaeology, Principal of ARS, Inc.	Principal Investigator, Historic Cultural Resources.
Natalie S. Waugh	Dames & Moore	B.A. Liberal Arts, M.A. English, 6 years experience in environmental regulatory compliance and multidisciplinary environmental planning.	Project Manager.
James R. Wagner	U.S. Bureau of Reclamation	B.S. Civil Engineering, 3 years experience in public health engineering.	Technical reviewer for air and water quality.
Gay Wilson	Consultant	M.A. Sociology, 2 years experience in social assessment.	Associate Principal Investigator, Social Resources.
Will Worthington	U.S. Bureau of Reclamation	M.S. Civil Engineering, 20 years experience, Chief of Dams Planning Branch, P.E.	Policy reviewer.
Terri Zaumseil	Dames & Moore	B.S. Natural Resources, 9 years experience.	Technical Editor.

GLOSSARY

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Abutment

That part of existing topography into which the end of a dam is constructed.

Acre-Foot

The quantity of water required to cover one acre of land to a depth of one foot; equivalent to 43,560 cubic feet or 325,851 gallons (U.S.).

Air Quality Standards (National Ambient Air Quality Standards):

Primary - the maximum pollutant levels allowable to protect the public health with an adequate margin of safety.

Secondary - the maximum pollutant levels allowable to protect the public welfare from any known or anticipated adverse effect.

Alluvium

General term for clay, silt, sand, gravel, or unconsolidated detrital material deposited by a stream or other body of running water.

Ambient

Encompassing or surrounding.

Animal Unit Month (AUM)

The amount of forage necessary for sustenance of one cow or its equivalent for a period of one month.

Artifact

An object (such as a tool or ornament) made or modified by human beings.

Artifact Scatter

A type of site characterized by sherds and/or lithics on the surface and no evidence of surface or subsurface architecture.

Bajada

A nearly flat surface formed from confluent alluvial fans along the base of a mountain range.

Ballcourt

A large oval-shaped feature surrounded by a berm which is usually associated with ceremonial activities (may have been used as a dance arena or for competitive sporting events).

Biotic Community

An interrelated, complex aggregation of plant and animal populations distributed primarily according to physical factors in the environment.

Bosque

A densely wooded area along a stream or river.

CFS (cfs)

Cubic feet per second. A unit of measure of the rate of liquid flow past a given point equal to one cubic foot in one second.

Check Dams

Usually small dams located on tributaries to slow flowing water, allowing for greater infiltration, temporary storage or to control erosion.

Concrete Gravity dam

A water retaining structure which derives its strength to hold back the water because of the enormous weight of the dam itself.

Confluence

The point where two streams converge and unite.

Conservation Pool

In a reservoir, that part of the storage volume dedicated to storing water for future use.

Conservation Storage

See conservation pool.

Dam Crest

The top of the dam.

Decibel (dB)

A unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain level.

Destroyed

As used in the context of the CAWCS for impacts to cultural resources, the elimination of significant data values which characterize a site.

Drawdown

Lowering of the water level of a reservoir by releasing water from the dam.

Earthfill Dam

A dam constructed of engineered soils; a typical earthfill dam would have several types of soil with different properties placed in "zones" within the embankment.

Easements

An interest in land owned by another that entitles its holder to a specific limited use.

Earth Fissures

Cracks in the alluvium of basins which have land subsidence due to large water level declines.

Effect

An interpretation of the significance of the impact.

Energy Management

The operation of a system (in this case CAP) to maximize energy use when energy is relatively inexpensive (during the winter or at night) and to have excess energy available when demand (and price) is high.

Endangered Species

Any species determined by the U.S. Department of the Interior to be in danger of extinction throughout all or a significant portion of its range.

Enhancement

To improve or make better than the existing condition.

Eutrophication

The process by which waters become enriched with an influx of nutrients required for the growth of aquatic plants such as algae that are important for fish and animal life.

Flood event

100-year flood event - calculated by the U.S. Army Corps of Engineers to be a flow of 215,000 cfs for the City of Phoenix.

200-year flood event - calculated by the U.S. Army Corps of Engineers to be a flow of 275,000 cfs for the City of Phoenix.

Flood outlet

Large low level outlets designed to release flood waters at high flowrates.

Floodproofing

An adjustment to a building or its contents which is designed to stop the inflow of water or to reduce the effects of water entry.

Flood plain

The relatively level land adjacent to a river channel which is covered by water when the river overflows its banks at times of high water; (200-year flood plain - the flood plain which is under water during a 200-year flood event).

Fluctuating pool

Water level between the typical year low and the typical year high pool elevations (as defined by prehistoric cultural resources for the purpose of this project).

Geomorphic

Pertaining to the surface features of the earth.

Gridded gardens (or waffle gardens)

A type of terrace system which was used to enhance agricultural productivity.

Ground water

Water which is stored or moving between the soil particles below the earth's surface. When all voids between the soil particles are filled with water, the soil is saturated. The top surface of the saturated soil is the water table.

Ground water recharge

Replenishing of ground water.

Hydropower

Power generated from the movement of water.

Head (hydraulic)

Energy which water has because of the depth or velocity of the water.

Infiltration

The movement of water or solution into soil or rock.

Inflow Design Flood (IDF)

A flood event used by design engineers to size facilities for a new dam; this is usually a very large flood. For CAWCS, the IDF equals the maximum probable flood (MPF).

Impact

Measured change due to a project action; residual impacts are those impacts which remain after mitigation.

Inactive pool

That part of the reservoir storage pool which is below the outlet works.

Less-than-annual pool

Water level between typical year high and Standard Project Flood (SPF); term defined by prehistoric cultural resources for the purpose of this project.

Levees

An embankment built to prevent overflow.

Lithic

made of stone.

Low-level outlets

A water conveyance system designed to release water from behind a dam by gravity flow from near the bottom of the reservoir.

Maximum annual recreation day

See recreation days.

Maximum Probable Flood (MPF)

Determined by hydrologic analyses. That flood which would result from the most severe combination of critical meteorological and hydrological conditions that are reasonably possible in the region (also known as PMF).

Maximum Storage Pool (MSP)

This represents the largest pool the reservoir would have when all space dedicated for the storage of conservation water is full.

Microclimate

Localized climate influenced by land form, elevation and other local environmental variables.

Minimum pool

This is the smallest pool a reservoir would have to meet specific requirements. For instance, a certain minimum pool may be required to support a fish population.

Mitigation

An action to reduce or eliminate an adverse impact.

Noise receptor

Residential, recreational, or other noise-sensitive land use.

Overdraft

Withdrawal of ground water in excess of replenishment.

Orogeny

The process of the formation of mountains.

Outlet works

A water conveyance facility designed to release water from behind a dam by gravity flow without having the water flow over the top of the dam.

Perennial stream

A stream that flows at all times.

Permanent pool

Water level up to the typical year low pool (defined by prehistoric cultural resources for the purpose of this project).

Petroglyphy

A carving or inscription on a rock.

Physiography

The study of the evolution of landforms.

Pithouse

A semi-subterranean brush house used as a permanent dwelling.

Prime farmland

Classification of U.S. Soil Conservation Service for lands with the soil quality, growing season, and moisture supply necessary to produce sustained high agricultural fields by modern farming methods.

Pueblo

A habitation site which is characterized by above ground, masonry architecture.

Pumping/generating facility

A reversible pump/turbine/motor/generator unit capable of pumping water from one elevation to a higher elevation using the motor to drive the pump. The unit can be operated in the reverse with water passing through to generate electricity.

Raptor

A bird of prey, e.g. eagle, hawk, etc.

Recreation day

A recreation day consists of an individual engaging in a specific activity for a significant period of time. The length of time is not defined but should be of such duration to clearly establish that the individual is participating in the specific activity by choice and the activity is for recreational purposes. Maximum annual recreation days are based on the carrying capacity of the resources and facilities as well as the length of the recreation season and the amount of recreation use that occurs on weekends. Maximum annual recreation days represent the capacity of the site without overcrowding. Only use at developed sites and on reservoirs is considered; no dispersed recreation activities are included.

Regulatory storage pool

That part of a reservoir allocated for the temporary storage of water so that flows in the rest of the delivery system can be better regulated.

Reversible canal

A level open-channel capable of passing flow in either direction.

Replacement pool

That part of a reservoir allocated to provide storage similar to the storage which was previously available.

Riparian

Associated with the banks of rivers or other stable water bodies.

Riprap

Broken stones or boulders placed compactly or irregularly on dams, levees, dikes, or similar embankments for protection of earth surfaces against the action of waves or currents.

Right-of-way

The right of passage over another's land.

Riffle

A natural shallows in a stream or river bed over which the water flows swiftly and the water surface is broken in waves by obstructions wholly or partly submerged.

Rookery

A communal nest site for birds.

Safety of Dams (SOD)

1978 Reclamation Safety of Dams Act (P.L. 95-578).

Salt loading

An increase in the volume of salts in a basin usually brought about by interbasin transfer of water. Salt loading is most critical in the plant root zone and in any aquifers which might be affected by the imported salts.

Sediment pool

That part of a reservoir which is allocated for the storage of debris and sediment carried by inflowing waters. Sediment may actually be deposited at almost any point in the reservoir and this reduces the amount of storage volume available for water storage.

Service outlet

Outlet works designed to deliver water to designated users.

Sherd

A fragment of a broken ceramic vessel.

Spillway

A conveyance facility which allows for water to pass over or around an obstruction such as a dam. A gated spillway is one which can be closed or opened; an ungated spillway is one which is open all the time.

Spillway surcharge space

The volume above the spillway crest occupied by floodwaters as reservoir inflow exceeds outflow. This condition causes the water surface to rise temporarily.

Standard Project Flood (SPF)

The flood that may be expected from the most severe combination of meteorologic and hydrologic conditions that are considered reasonably characteristic of the region.

Subsidence

A lowering of ground elevation as a result of excessive ground water pumping, dewatering of sediments, ground movements due to earthquakes, etc.

Surcharge pool

See spillway surcharge space.

Terrace (agriculture)

An artificial ridge or embankment of earth built for the purpose of conserving moisture, controlling runoff, or reducing erosion.

Threatened species

Any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Turbidity

The state, condition, or quality of reduced clarity of a fluid due to the presence of suspended material in the fluid.

Typical-year pool

Water level of a reservoir during a "typical year" of operation based upon the Bureau of Reclamation computer model elevation - duration curves. These pools (high and low) were devised for use in impact assessment because they are representative of the way a reservoir could reasonably be expected to fluctuate.

Water exchange

An institutional arrangement utilizing physical facilities where one user's water is stored while his water needs are met by deliveries from a second user and then the second user has water "credits" against this first user; during a later period the second user may request that his credited water be released from the first user's storage facilities and delivered as required.

Water supply outlets

See service outlet.

Water yield

The volume of water which is available as a result of operations of a water system.

Visitor-days

A measure of impact; one visitor day equals twelve hours of use of a site.

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B. Description of Supporting Documents

The following briefly describes the contents of the EIS supporting documents. Information contained in these documents has been greatly abbreviated in the EIS. Readers wishing to consult the supporting documentation for details of the alternative plans, affected environment, assessment methodologies, and plan impacts and effects should contact the Bureau of Reclamation, Arizona Projects Office, Phoenix.

1. Designs and Estimates

This document includes all calculations for the designs and estimates used in making the November 1981 decision to choose Plan 6 as the agency proposed action. It also contains supporting designs and estimates for the draft environmental impact statement.

2. Plan Formulation

This report documents the activities undertaken in the CAWCS which led to the selection of a proposed action. It includes study background information, a description of the plan formulation process, a discussion of the candidate plans formulated and studied during Stage III, and a display of the proposed action (Plan 6).

3. New Waddell Sizing Study

This report documents the activities undertaken by the Bureau to develop and evaluate options to determine which New Waddell Dam size would be appropriate for feasibility design. The report contains a description of alternatives, including costs, benefits, and environmental and social effects. It also covers areas such as pump generator sizing, sediment distribution, and pumped storage.

4. Recreation Planning

This document identifies the recreational planning processes that were involved in the CAWCS Stage III work, the resulting conceptual plans which were developed and the anticipated facility costs and recreation days provided by each site. The document includes: a discussion of the Corps of Engineer's and Bureau of Reclamation's planning efforts and potential impacts of the plans; summaries of anticipated use by facilities and site; and a discussion of the economic aspects of the recreational plans.

5. Safety of Dams

This document contains two sections, one covering the Salt River dams and the other covering the Verde River dams. The report defines the Safety of Dams problems foreseen and possible solutions.

6. Nonstructural Flood Damage Reduction

This report documents a study completed by the U.S Army Corps of Engineers on nonstructural flood mitigation measures. It includes a definition of the flood problem, possible nonstructural mitigation measures, and an evaluation of these measures.

7. Economics - Financial

This report documents the economic analyses which occurred during CAWCS Stage III. It includes analysis of flood control benefits, water supply benefits, and hydropower benefits.

8. Hydrology

This document presents the hydrologic analysis of the Gila River drainage basin for CAWCS. It also includes data on water requirements, water rights, water quality and sedimentation. A hydraulic analysis of the Salt and Gila Rivers is also presented.

9. Social Impacts and Effects of CAWCS Plans

This report documents the social impacts and effects of Stage III plans, describes existing and future conditions for the affected populations, provides a summary of findings in the Social Well-Being (SWB) Account, and describes the social assessment process in CAWCS. It also provides a description of the methodology used for the social assessment.

10. Second Level Environmental Inventory

This document is a working paper that provides an inventory of environmental resources in the CAWCS study area. The inventory describes resources in biology, geology/soils, acoustics, water, air, land use, recreation, prehistoric and historic cultural resources, and visual quality. This report is the result of extensive literature reviews and agency contacts in all disciplines, and field studies in biology and cultural resources. The data were developed for the purpose of assessing the impacts of alternative plans.

11. Biological Assessment of Endangered Species

This report documents effects of CAWCS plans on Federal-designated threatened and endangered species in the CAWCS study area. The species include bald eagle, Yuma clapper rail, peregrine falcon, Gila topminnow, and Turk's head and Arizona hedgehog cacti.

12. Stage III Methodology for Environmental Quality Assessment

This document describes the methodology for assessing impacts to environmental quality in Stage III of the CAWCS. Impact assessment measures and criteria for determining effects are described for the following factors: biological resources, water quality, air quality, sound quality, visual quality, land quality, geological resources, cultural resources and recreation.

13. Regional Future Without the Project

This document forecasts the most likely future conditions in central Arizona without Central Arizona Project regulatory storage or flood control along the Salt and Gila Rivers through the Phoenix area. The purpose of this forecast is to provide a framework for assessing the impacts of alternative plans.

14. Summary and Evaluation of CAWCS Public Involvement Program

This report includes a summary and evaluation of public involvement activities conducted in the CAWCS from January 1979 to October 1981. The report describes these activities, details the results of major Stage III public involvement efforts, and presents an evaluation of public involvement activities from the perspective of CAWCS and participants in the public involvement process.

15. Environmental Impacts and Effects of Plans (7 Volumes and Appendices)

These reports document the environmental impacts and effects of CAWCS Stage III plans. They describe existing and future conditions for the disciplines of biology, water quality, air quality, sound quality, visual quality, land quality, geology/soils, prehistoric and historic cultural resources, and recreation. A separate appendix accompanies each plan. Included in these are descriptive data, by plan component, for each discipline.

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