

Colorado – Lower Gila Watershed

Watershed Description

This watershed is defined by the Colorado River drainage area, from Hoover Dam at Lake Mead to the Mexico border near Yuma. It does not include the Bill Williams River drainage or the Gila River above Painted Rocks Dam.

Land ownership is divided approximately as: 89% federal, 6% state, 4% tribal, and 1% private. Except for communities along the Colorado River (e.g., Yuma, Bullhead City, Lake Havasu City, Kingman), most of this 14,459 square mile watershed is sparsely populated with only 187,700 people (2000 census).

Due in part to the sparse population, six wildlife refuges and three wilderness areas have been established in this watershed, along with several military bases with live fire exercise areas. All of these have restricted land uses. Tribal and private land is primarily along the Colorado River and lower Gila River and is intensively cultivated. Open grazing occurs across the watershed.

Elevations range from 5,450 feet (above sea level) in the mountains near Lake Mohave to 80 feet along the Colorado River as it flows into Mexico. The area contains low desert fauna and flora, and support warmwater aquatic communities where perennial waters exist.

Water Resources

Precipitation is meager, varying from 3 to 10 inches a year. Perennial water is limited to the Colorado River mainstem and its reservoirs, with irrigation return flow providing perennial flow in the Gila River near Yuma.

An estimate of surface water resources in the Colorado – Lower Gila Watershed is provided in **Table X**. Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Colorado – Grand – Lower Gila Watershed

Excluding Indian Lands

	Perennial	Intermittent	Ephemeral
Stream miles	375	145	13,545
	Perennial	Non-perennial	
Lake acres	36,860	0	

On Indian Lands – Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles	75	0	535
	Perennial	Non-perennial	
Lake acres	245	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:

Generalized topography

Highways

Cities

National Forests, Monuments, Refuges

HUCs (the subdivisions by number)

Watershed Partnerships

- Northwest Arizona Watershed Council
Their area is defined by three groundwater basins: Hualapai Valley (in the Colorado-Grand Canyon Watershed), Sacramento Basin (in the Colorado-Lower Gila Watershed), and Big Sandy (in the Bill Williams Basin). The council's goal is to protect and preserve water resources and educate the public about water issues related to growth and development. The council meets on the 3rd Wednesday of the month in Kingman, AZ. For information, contact Elmo Roundy (928) 757-2818 or Earl Engelhardt at (928) 692-1068 or imspirit@kingmanaz.net.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL if completed can be obtained at ADEQ's website: www.azdeq.gov

- The Colorado River below Hoover Dam is impaired by selenium. Selenium bioaccumulates and may pose a risk to aquatic life and wildlife that prey on aquatic life (e.g., some birds). Long term monitoring below Hoover Dam will help support TMDL development. Investigations are needed to determine source loadings, especially contributions from natural background and other states (Nevada, Utah, Colorado, and upper Colorado Basin states). The TMDL is scheduled to be initiated in 2009.
- Gila River near Dome is impaired due to boron and selenium. Elevated boron can be toxic to plant growth. Selenium bioaccumulates and may pose risks to aquatic life and wildlife that prey on aquatic life. Elevated selenium and boron may be associated with the extensive irrigated agriculture in this area near Yuma. These TMDLs may be complex due to the large number of potential sources, seasonal influences, and natural background considerations.
- Painted Rocks Borrow Pit is impaired due to pesticides contamination in fish and low dissolved oxygen. This lake was closed to the public for recreational uses, including fishing, after a fish consumption advisory was issued due to pesticides in fish tissue (DDT metabolites, toxaphene, and dieldrin). The pesticide TMDLs for this lake will be developed in association with the ones for several reaches of the Gila River and Painted Rock Reservoir (see TMDL discussion in the Middle Gila Watershed). It is scheduled to be initiated in 2009.

A 1992 diagnostic feasibility study by ADEQ indicated that the low dissolved oxygen in the lake was due to the design and maintenance of this shallow lake. During the past several years, the lake has been dry or at best a mud hole, and further representative samples could not be collected. A TMDL will be initiated when there is sufficient water in the lake.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: <http://www.azdeq.gov/enviro/water/watershed/fin.html>.

- **The Greater Kingman Wildcat Dump Cleanup Project**
Northwest Arizona Watershed Council (2000)
Clean up of 18 wildcat waste dump sites in the Kingman areas to reduce potential surface and ground water contamination. The project also provided education and outreach to solicit community participation and minimize further dumping.

Water Protection Fund Projects – The following Water Protection Fund Projects have been awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: <http://www.azwater.gov>.

- **Colorado River Indian Tribes 30 Acre Riparian Revegetation Project**
The Colorado River Indian Tribes (2000)
Restore 30 acres of riparian area in the Ahakhav Tribal Preserve on Deer Island. This would complement the 75 other acres restored in 1997.
- **Yuma East Wetlands Riparian Revegetation Project**
The City of Yuma (2004)
Restore 25 acres of critical riparian habitat along the Colorado River near Yuma.
- **Yuma East Wetlands Restoration Project**
Quechan Indian Nation (2005)
Restore 25 acres of riparian area, 20 acres of river channel, and 10 acres of wetland habitat.

Other Water Quality Studies

Water Issues of the Arizona - Mexico Border: The Santa Cruz, San Pedro, and Colorado Rivers.
Terry W. Sprouse, University of Arizona, Water Resources Research Center (2005)
Summary of water quality and water quantity issues facing this region.

Yuma East Wetlands Restoration Plan

The Yuma East Wetlands includes 1,100 acres of riparian habitat, 148 acres of open water, 98 acres of marshland, and 20 acres of agricultural land along the Colorado River, between the Gila River and the Ocean-to-Ocean Bridge in Yuma. The plan is to restore native riparian, wetland, and aquatic habitats along the lower Colorado River and create an interpretive center and nature park for education and low impact recreation opportunities.

The Clean Colorado River Alliance Report

The Clean Colorado River Alliance (2006)

Arizona Governor Janet Napolitano commissioned this study in 2005 to identify the major issues or concerns affecting water quality in the Colorado River. This report identifies several pollutants of particular concern for the lower Colorado River: nutrients, metals, endocrine disrupting compounds, perchlorate, bacteria and pathogens, salinity/total dissolved solids, and sediment. It also describes the impacts of these pollutants, discusses current mitigation efforts to address them, and sets forth a number of recommendations.

Arizona Backwater Manipulations for Endangered Fishes: Management Implications of Selenium on National Wildlife Refuges of the Lower Colorado River

U.S Fish and Wildlife Service (Project ID 22410-1261-2N37) (2006)

Backwater lakes along the Colorado River are used to raise federally listed threatened and endangered native fish. This was a study to determine whether the bioaccumulation of selenium in these backwaters presented a danger to these species. The study documented continued selenium bioaccumulation in crayfish and fishes in 2001 to 2004, but water concentrations of selenium seem diminished in comparison to previous field studies. Fish and Wildlife Service will continue to monitor water sediment and crayfish.

Status of Federal and State Listed Warm Water Fishes of the Gila River Basin, with Recommendations for Management

Desert Fishes Team Report Number 1 (2003)

This report reviews the status of 12 federal and state listed native warm water fishes in the Gila River basin and the post 1967 recovery and conservation actions taken by all agencies, organizations, or parties. General conclusions and recommendations:

- Six species are extirpated from the basin,
- Five species survive in less than 20% of their original range
- The distribution and abundance of all listed species has declined since their listing and the trend is continuing.
- Although repatriation has been the primary management effort, it has occurred for only a few species and with limited success.
- Few of the recommendations in the biologically-based recovery plans have been implemented.
- Control and removal of nonnative fish species and other aquatic flora and fauna is the most urgent and overriding need in preventing the continued decline and ultimate extinction of the native fish.

Border Crossings – Water and Wastewater at the International Boundary

R.G. Charles Graf and Craig Tinney (ADEQ) and Tom Konner (EPA Region IX)

September/October 2005 Southwest Hydrology (2005)

This article describes the problems and progress being made in addressing water quality and wastewater infrastructure along the Mexican border with California and Arizona for seven key populations centers: San Diego/Tijuana, Tecate, Calexico/Mexicali, San Luis/San Luis Rio Colorado (Yuma area), Nogales, Naco/Bisbee, and Douglas/Agua Prieta.

Assessments

The Colorado – Lower Gila Watershed is separated into the following drainage areas (subwatersheds):

15030101	Mohave -Havasu
15030103	Sacramento Wash
15030104	Imperial Reservoir
15030105	Bouse Wash
15030106	Tyson Wash
15030107	Lower Colorado
15030108	Yuma Desert
15070201	Lower Gila
15070202	Tenmile Wash
15070203	San Cristobal Wash

These drainage areas and the surface waters assessed as “attaining” or “impaired” are illustrated on the following watershed map. Methods used to complete these assessments are described in the “Surface Water Assessment Methods and Technical Support” document (2006).

Map Assessed waters

COLORADO RIVER From Hoover Dam to Lake Mohave (below Lake Mead) 15030101 -- 015 40.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Attaining DWS – Inconclusive Agl – Attaining AgL – Attaining	Category 5 Impaired	Selenium	Added selenium in 2004

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/12/2000 – 09/09/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Hoover Dam USGS #09421500 CLCLR243.26 (not in ADEQ's database)	USGS Ambient	18-23 dissolved metals only: Antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, uranium, and zinc	23 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	23 Total dissolved solids 20 Suspended sediment concentration 9 Turbidity 7-23 Pesticides

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	04/12/2002 – 6.6 mg/L 03/20/2003 – 6.4 mg/L 06/30/2003 – 6.6 mg/L 09/04/2003 – 6.2 mg/L	Inconclusive – 4 of 23 samples were low in dissolved oxygen (binomial)
Selenium	2.0 µg/L A&Wc chronic	03/21/2000 – 3.0 µg/L 04/20/2000 – 3.0 µg/L 02/20/2001 – 2.2 µg/L 05/23/2002 – 2.5 µg/L 03/20/2003 – 2.2 µg/L 04/30/2003 – 2.3 µg/L 09/04/2003 – 2.2 µg/L 03/03/2004 – 2.3 µg/L	Remains impaired – 8 exceedances during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient E. coli bacteria and fluoride to assess FBC and DWS		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		High Priority – Collect selenium samples to support TMDL development. Collect additional dissolved oxygen samples due to the low readings Collect core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for dissolved mercury.	

COLORADO RIVER From Bill Williams River to Osborne Wash 15030104 -- 020 13.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Attaining DWS -- Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/24/2000 – 08/26/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Parker Dam USGS #09427520 CLCLR195.22 100742	USGS Ambient	17-29 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-20 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	17 <i>E. coli</i> bacteria 20 Fluoride 20 Total dissolved solids 19 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	10/01/2003 – 3 µg/L	Inconclusive – Only 1 exceedance during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional selenium samples due to the exceedance. Use a lower lab detection limit for dissolved mercury.	

COLORADO RIVER From Imperial Dam to Gila River 15030107 -- 003 15.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining DWS -- Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/26/2000 – 08/25/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Imperial Dam USGS # 09429490 CLCLR048.36 100752	USGS Ambient	12-19 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	12-19 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	11 <i>E. coli</i> bacteria 19 Fluoride 19 Total dissolved solids 19 Suspended sediment concentration 18 Turbidity 5 Pesticides

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	08/21/2003 – 5.0 mg/L 08/25/2004 – 5.7 mg/L	Attaining – Only 2 low dissolved oxygen measurements in 18 visits (binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for dissolved mercury.	

COLORADO RIVER From Main Canal to Mexico border 15030107 -- 001 32.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 5 Impaired	Selenium and low dissolved oxygen	Add selenium and dissolved oxygen to the 303(d) List

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/24/2000 – 08/26/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Morelos Dam USGS # 09422000 CLCLR023.30 100744	USGS Ambient	19-30 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-30 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	19 <i>E. coli</i> bacteria 30 Fluoride 30 Total dissolved solids 30 Suspended sediment concentration 21 Turbidity 16 Pesticides 3-4 Radiochemicals

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
DDE (dissolved)	0.001 µg/L -- Agl, AgL, FC 0.02 µg/L -- A&Ww chronic 0.1 µg/L – DWS	07/25/2001 – 0.24 µg/L	Inconclusive – Only 1 exceedance of the chronic standard during the assessment period. Only 1 in 16 samples exceeded other standards (binomial).
Diphthalate (dissolved)	0.0001 µg/L – FC 0.002 µg/L – DWS and A&Ww chronic 0.09 µg/L – FBC	07/25/2001 – 0.32 µg/L	Inconclusive – Only 1 exceedance of chronic standard during the assessment period.
Dissolved oxygen	6.0 mg/L A&Ww	06/21/2001 – 5.0 mg/L 07/24/2001 – 5.2 mg/L 08/23/2001 – 5.6 mg/L 08/27/2002 – 5.3 mg/L 07/29/2003 – 5.3 mg/L 08/19/2003 – 5.0 mg/L 08/24/2004 – 5.4 mg/L	Impaired – 7 of 30 samples exceeded standards (binomial).
Alpha Hexachlorocyclohexane	0.006 µg/L – DWS 0.01 µg/L – FC 0.22 µg/L – FBC	07/25/2001 – 0.31 µg/L	Attaining – Only 1 exceedance in 13 samples exceeded standards (binomial)
Gamma Hexachlorocyclohexane (Lindane)	0.2 µg/L – DWS 0.28 µg/L – A&Ww chronic	07/25/2001 – 0.42 µg/L	Inconclusive – Only 1 exceedance during the assessment period.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	08/19/2003 – 0.3 µg/L	Inconclusive – Only 1 exceedance during the assessment period. The lab detection limit on all other selenium samples was above the chronic standard, so they could not be used for determine attainment.

Mercury (dissolved)	0.01 µg/L A&Ww chronic	08/19/2003 – 0.3 µg/L	Inconclusive – Only 1 exceedance during the assessment period.
Selenium	2.0 µg/L A&Ww chronic	05/20 2003 – 3.0 µg/L 08/19/2003 – 3.0 µg/L 08/24/2004 – 2.5 µg/L	Impaired – 3 exceedances during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
DDE, diphthalate, Gamma hexachlorocyclohexane, and mercury	Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		<p>High Priority – Collect samples to support dissolved oxygen and selenium TMDLs.</p> <p>Collect additional DDE, diphthalate, Gamma hexachlorocyclohexane, and mercury samples due to the exceedances.</p> <p>Use a lower lab detection limit for dissolved mercury.</p>	

GILA RIVER From Coyote Wash to Fortuna Wash 15070201 -- 003 28.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining Agl – Impaired AgL – Attaining	Category 5 Impaired	Boron, selenium	Added boron and selenium in 2004

MONITORING USED IN THIS ASSESSMENT			
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/16/2000 – 05/18/2005	
		NUMBER AND TYPES OF SAMPLES	
		Metals	Other
Near Dome, AZ CLGLR010.53 100455	ADEQ and USGS Ambient	8-22 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, and zinc. 22 total metals only: Boron and manganese	21-22 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH 17 <i>E. coli</i> bacteria 22 Fluoride 18 Total dissolved solids 11 Suspended sediment concentration 22 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Boron	1000 µg/L Agl	02/16/2000 – 1200 µg/L 03/21/2000 – 1500 µg/L 11/01/2001 – 1200 µg/L 05/21/2003 – 1100 µg/L 02/18/2004 – 1100 µg/L 04/23/2004 – 1700 µg/L	Remains impaired – 6 exceedances in 22 samples (binomial).
Dissolved oxygen	6.0 mg/L A&Ww	09/21/2000 – 3.2 mg/L 05/31/2001 – 5.2 mg/L 09/15/2001 – 3.4 mg/L 08/20/2002 – 3.5 mg/L	Inconclusive – 4 low dissolved oxygen measurements in 22 samples (Binomial method requires a minimum of 5 exceedances to be assessed as impaired.)
<i>E. coli</i> bacteria	235 CFU/100 ml FBC	02/22/2005 – 290 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years. Lab result did not exceed the screening value (300 CFU/100 ml).
Selenium	2.0 µg/L A&Ww chronic	03/21/2000 -- 5.4 µg/L	Remains impaired – Only 1 exceedance during the assessment period. The lab detection limit for all other samples was above the A&Ww chronic criterion, so they could not be used to determine attainment.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and <i>E. coli</i> bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than the A&Ww chronic criteria in at least 17 samples.
MONITORING RECOMMENDATIONS		Medium Priority – Collect samples to support boron and selenium TMDL development. Collect dissolved oxygen and <i>E. coli</i> samples due to exceedances. Use a lower lab detection limit for selenium and dissolved mercury.	

HUNTER'S HOLE (Colorado River backwater) 15030108 -- 0660 15 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/08/2000		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid lake CLHUN - B 102548	AGFD Ambient	1 total metals only: Chromium, copper, lead, manganese, mercury, selenium	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen	1 Fluoride 1 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	20 µg/L A&Ww acute	09/08/2000 – 22 µg/L	Inconclusive – Only 1 exceedance in last 3 years of monitoring. Magnitude of the exceedance should be noted.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for total mercury was higher than the FC criterion.
MONITORING RECOMMENDATIONS		<p>Medium Priority – Collect additional selenium samples due to the exceedance.</p> <p>Collect sufficient core parameters to represent at least 3 seasons during an assessment period.</p> <p>Use a lower lab detection limit for mercury.</p>	

LAKE HAVASU 15030101 -- 0590 19,780 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Inconclusive Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/03/2000 – 09/09/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Bass Bay - 102349 Body Beach – 100123 East State Beach – 100124 Nautical Beach – 100152 North Channel – 100168 Pilot Rock – 100157 South Channel – 100164 West State Beach – 100171 Bighorn Point – 102350 Cattail Cove – 102351 Crazy Horse Beach – 102352 Friendly Island – 102353 Frog Point – 120354 North Rotary Beach - 100123 Partners Point – 102355 Rocky Landing – 102368 Sandpoint Marina – 102356 Satellite Cove – 102357 Solitude Cove – 102358 South Rotary Beach – 100121 Standard Wash Cove – 102359 Steamboat Cove – 102360 Three Dunes Cove – 102361 Up river – 102362 Windsor #4 – 102364 Windsor Cove – 102363 Wren Cove – 102349	Mohave County Health Dept Beach Monitoring (<i>E. coli</i> bacteria)	14-33 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc 9 total metals only: Thallium	29-33 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 32 Dissolved oxygen 33 pH	1285 <i>E. coli</i> bacteria 34 Fluoride 31 Total dissolved solids 36 Turbidity
Body Beach – 100132 Cattail Cove – 100124 Crazy Horse Cove – 100139 London Bridge – 100150 Middle Rotary Beach - 100122 Nautical Cove – 100151 North Rotary Beach - 100123 South Channel – 100164 South Rotary Beach - 100121 Windsor Beach – 100130 Off Windsor Beach - 100155	ADEQ Ambient (<i>E. coli</i> bacteria and field measurements)			
Parker Dam - 100098 At Colorado River – 100101 Mid Lake – 100102 Mid Thompson Bay – 100170 Site C – 100099	ADEQ Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
<i>E. coli</i> bacteria	235 CFU/100 ml	<u>East State Beach Shoreline</u> 05/17/2000 – GT 2000 CFU/100 ml 05/24/2000 – 1470 CFU/100 ml <u>Crazy Horse Beach</u> 05/17/2000 – 340 CFU/100 ml <u>Up River</u> 05/19/2000 – GT 2000 CFU/100 ml <u>West State Beach Shore</u> 05/24/2000 – 1040 CFU/100 ml <u>Windsor Cove</u> 05/24/2000 – 260 CFU/100 ml <u>Nautical Beach</u> 07/18/2000 – GT 2395 CFU/100 ml <u>Bass Bay</u> 08/31/2000 – 368 CFU/100 ml <u>Windsor #4</u> 06/21/2001 – 240 CFU/100 ml <u>Standard Wash Cove</u> 05/23/2002 – 501 CFU/100 ml	Inconclusive – Two exceedances at one beach, but none at that beach in the last 3 years of monitoring. Only 1 exceedance at 8 other sites. Note that only 2 exceedances occurred after 2000, at that they were at different beaches. (See additional discussion below.)
Mercury (dissolved)	0.01 µg/L – A&Ww chronic 0.6 µg/L – FC	11/28/2001 – 0.8 µg/L (at 2 sites on that date)	Inconclusive – For A&Ww assessment, only 1 exceedance during the assessment period. -- For FC assessment, only 1 of 5 sampling events with an exceedance (2 of 8 samples, as exceedance occurred at 2 sites on the same date) (binomial).
Selenium	2.0 µg/L A&Ww chronic	05/08/2001 – 4 µg/L 09/30/2003 – 3 µg/L	Inconclusive – 2 exceedances in a 3 year period; however, both exceedances occurred near the lab detection limit (2 µg/L). Will continue to monitor selenium levels.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury and selenium	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria in at least 9 samples.
<i>ESCHERICHIA COLI</i> BACTERIA EXCEEDANCES		Because of the size of this reservoir, ADEQ assesses the bacteria exceedances at each site separately, rather than combining all exceedances.	
MONITORING RECOMMENDATIONS		Medium Priority –Continue bacterial monitoring at beaches. Collect additional mercury and selenium samples. (Note that the Colorado River is impaired based on selenium in upstream reaches.) Use lower lab detection limits for selenium and dissolved mercury.	

LAKE MOHAVE 15030101 -- 0960 27,045 Acres (Arizona side)	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/03/2003 – 10/29/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Davis dam CLMOH - A 100030	ADEQ Ambient	3 total and 3 dissolved metals: Cadmium, chromium, copper, lead, nickel, silver, and zinc 3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, selenium, and thallium	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 2 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Wc chronic	10/01/2003 – 3 µg/L	Inconclusive – Only 1 exceedance during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Insufficient <i>E. coli</i> bacteria samples to assess FBC.		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional selenium samples due to the exceedance. Collect sufficient core parameters to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for dissolved mercury.	

MARTINEZ LAKE 15030104 -- 0880 600 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/22/2002 – 06/10/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid Lake CLMAZ - A 101790	ADEQ Ambient	3 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, pH 2 Dissolved oxygen	3 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for dissolved mercury was below the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for dissolved mercury.	

MITTRY LAKE 15030107 -- 0950 385 acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Attaining FC – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/10/2003 – 08/22/2002		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam CLMIT - A 100030	ADEQ Ambient	3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium copper, lead, manganese, mercury, nickel, selenium, silver, thallium and zinc	2 sample: Ammonia, total nitrogen, total phosphorus, nitrate/nitrite, total Kjeldahl nitrogen 3 Dissolved oxygen, pH	3 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Need dissolved metals (cadmium, copper, and zinc), mercury, fluoride, arsenic, chromium, lead, boron, manganese, and copper to assess A&Ww, FC, DWS, AgI, and AgL.		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority –Collect sufficient core parameters to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for dissolved mercury.	

PAINTED ROCK BORROW PIT LAKE 15070201 -- 1010 185 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Ww – Impaired FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 5 Impaired	Low dissolved oxygen	Dissolved oxygen listed in 1992.
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	DDT metabolites, toxaphene, and chlordane	EPA relisted pesticides in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/21/2000 – 04/10/2001 (dry or nearly dry since)		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid lake CLPRL - B 100050	USFWS for Corp of Engineers Ambient	1 total metals: Arsenic, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc	2 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 5 Dissolved oxygen, pH	1 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	05/10/2000 – 3.0 mg/L 06/13/2000 – 3.4 mg/L	Remains impaired – 2 exceedances in 5 sampling events. Insufficient water in the lake since 2000 to monitor.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters		Lab detection limit for selenium was higher than the A&W chronic criterion.
DISCUSSION OF PESTICIDE IMPAIRMENT		Evidence of potential pesticide impairment: <ul style="list-style-type: none"> A risk assessment completed in 2006 supports continuation of the fish consumption advisories. Fish consumption advisories for pesticides in effect since 1991. 	
MONITORING RECOMMENDATIONS		High Priority – Collect pesticide and dissolved oxygen samples to support TMDL development. (Must wait for lake to refill and stabilize. Has been dry for several years due to the extended drought.) Collect sufficient core parameters to represent at least three seasons during an assessment period. Use a lower lab detection limit for selenium.	