

San Pedro Watershed

Watershed Description

This watershed encompasses three hydrological areas:

- San Pedro River, which begins in the mountains near Cananea Sonora, Mexico, and flows north about 100 miles through the southeast corner of Arizona to join the Gila River near Winkelman, Arizona;
- Willcox Playa, a terminal basin (does not drain out of the area), which contains a 30,000 acre ephemeral lake (playa); and
- Two relatively short drainages that flow to the Rio Yaqui in Mexico: Whitewater Draw and Black Draw.

It is a 7,015 square mile watershed is lightly populated with only 130,000 people (2000 census). Communities in the area include the rapidly growing Sierra Vista area and several historic towns, such as Tombstone, Douglas, and Bisbee. Grazing is widespread, with significant areas of irrigated agriculture located on the eastern side of the watershed. Historic copper, silver, and gold mining took place across the watershed; however, only a few mines are still active. Land ownership is divided approximately as: 40% private, 40% state, 20% federal (no tribal land). The Bureau of Land Management established a 50,000 acre San Pedro Riparian National Conservation Area in 1988 to protect this critical habitat.

Elevation varies from 4,000 feet (above sea level), with desert grassland and warmwater aquatic communities, to 10,700 feet at Mount Graham, with alpine forest. Areas above 5,000 feet typically support coldwater aquatic communities where perennial waters exist.

Water Resources

The area gets little precipitation, with 10-15 inches of rain and 0-5 inches of snow. Springs provide perennial flow to segments of the San Pedro River and other streams in this watershed. Concerns have been raised about ground water pumping and water demand in the rapidly growing Fort Huachuca Army Base – Sierra Vista area and the potential impact on perennial flow in the San Pedro River. In 2003, a Fort Huachuca Preservation Legislation required the Secretary of Interior to develop water use management and conservation measures necessary to restore and maintain the sustainable yield of the aquifer.

An estimate of surface water resources in the Salt Watershed is provided in the following table.

Estimated Surface Water Resources in the San Pedro Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	195	665	6,610
	Perennial	Non-perennial	
Lake acres	1,319	29,471	

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

Assessments

The San Pedro Watershed can be separated into the following drainage areas (subwatersheds):

15050201	Willcox Playa
15050202	Upper San Pedro
15050203	Lower San Pedro
15080301	Whitewater Draw
15080302	San Bernardino Valley

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 “2010 Surface Water Assessment Methods and Technical Support” document.

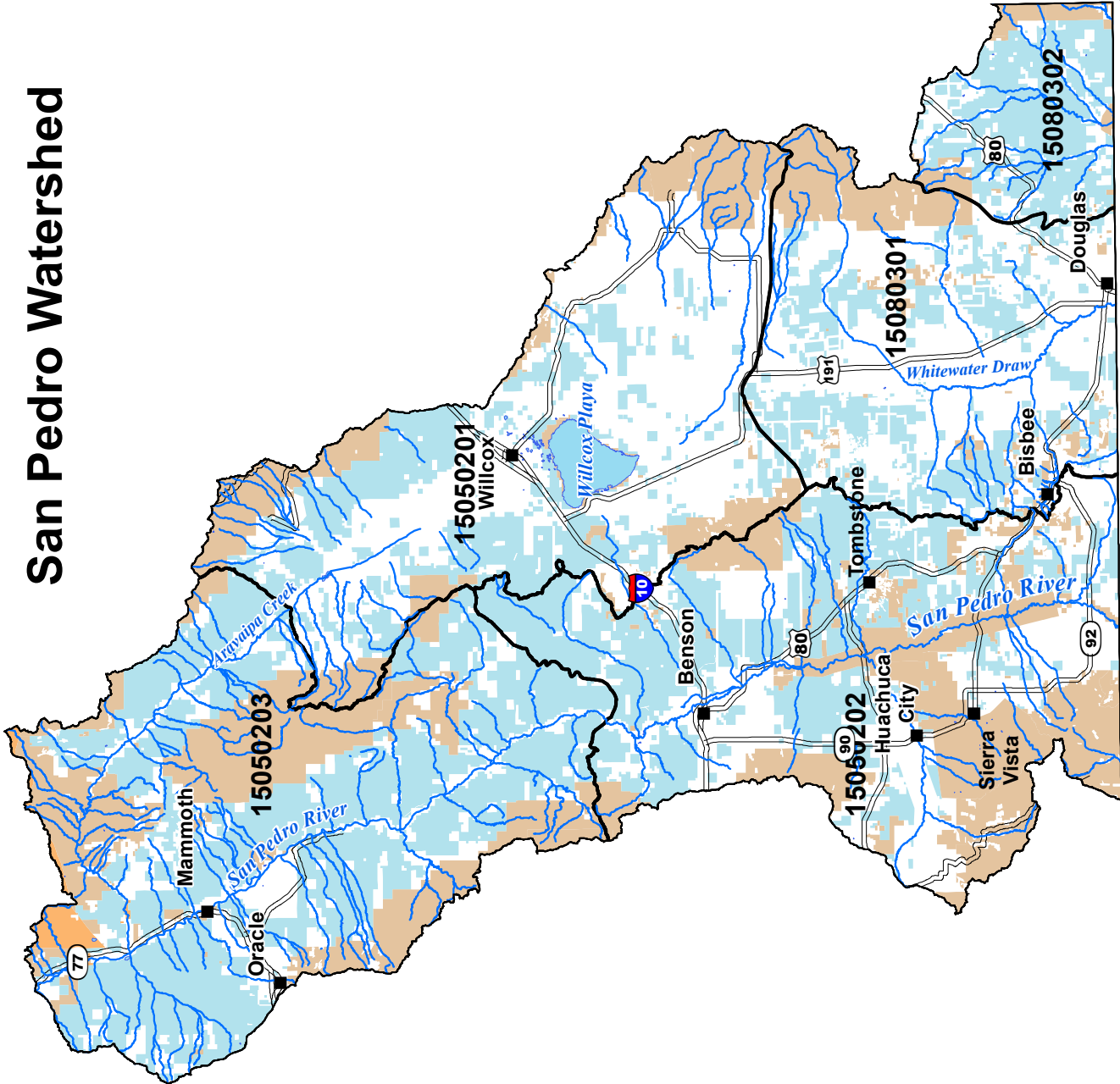
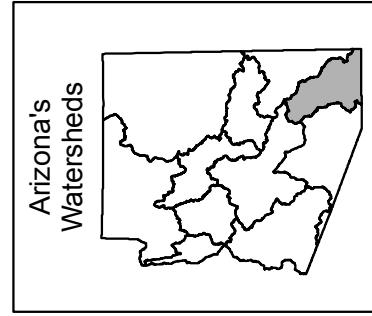
San Pedro Watershed

Legend

- Towns
- Streams
- Highways
- Lakes
- HUC Watershed Boundaries

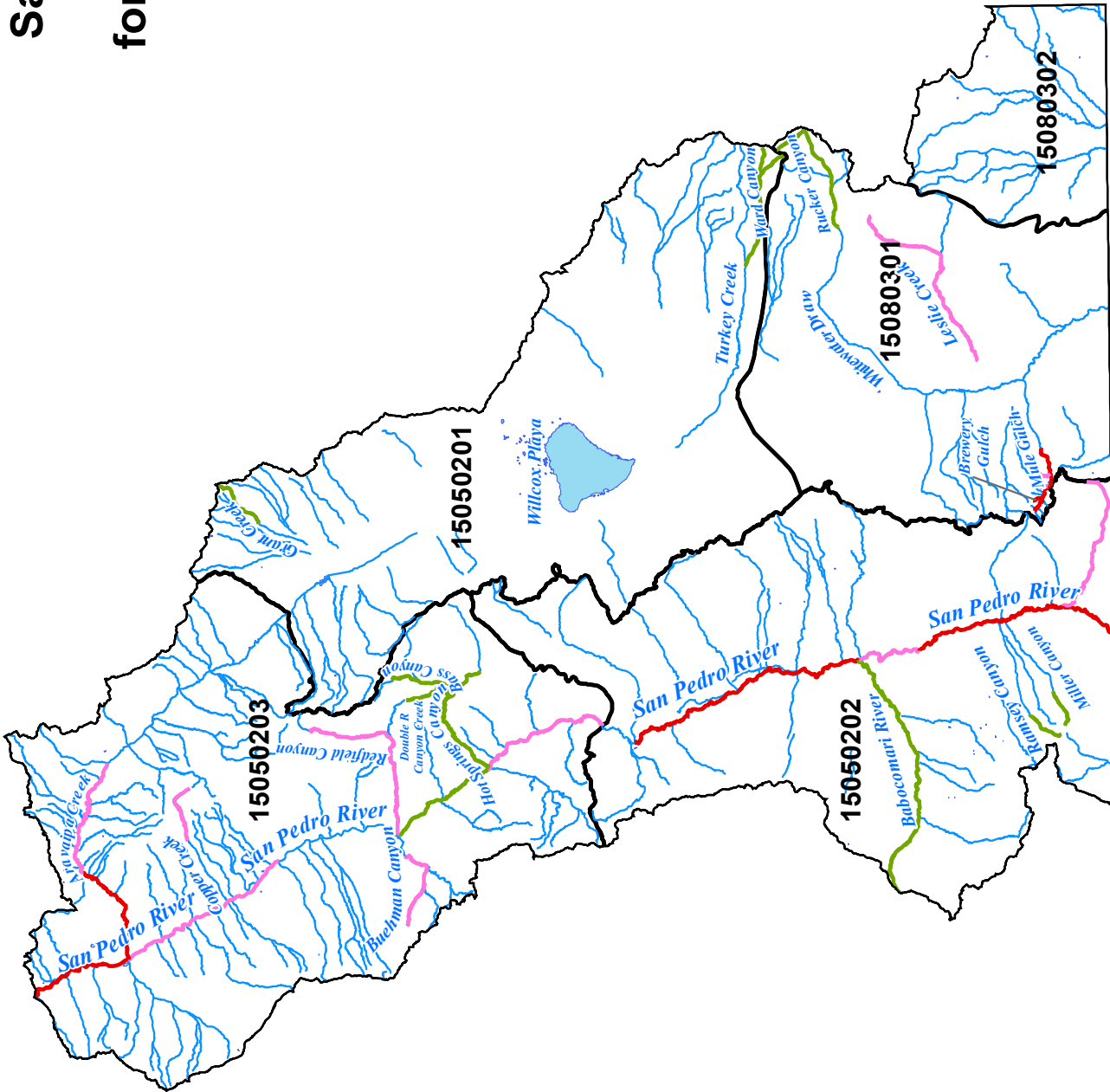
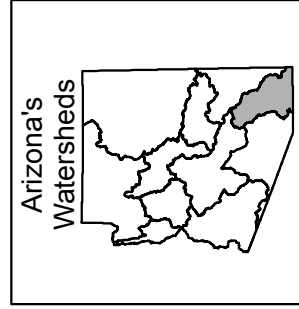
Land Ownership

- Federal
- Private
- State/County/Municipal
- Tribal



San Pedro Watershed 2010 Assessment for Streams and Lakes

- Legend**
- Streams
 - Lakes
 - HUC Watershed Boundaries
- Assessed Streams**
- ADEQ and EPA Listings**
- Attaining
 - Inconclusive
 - Not Attaining
 - Impaired
 - EPA Impaired
- Assessed Lakes**
- ADEQ and EPA Listings**
- Attaining
 - Inconclusive
 - Not Attaining
 - Impaired
 - EPA Impaired



Aravaipa Creek

Stowe Gulch - end of Aravaipa Wilderness Area
15050203-004B
15.5 mile
Outstanding Arizona Water

Category 3
Inconclusive

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

No Exceedances

Monitoring Summary

Sampling period: 8/20/2008 - 12/15/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At Hells Half Acre Canyon	SPARA011.92	100716	ADEQ	Ambient, Stream Ecosystem Monitoring
At Nature Conservancy Near Klondyke	SPARA026.35	106882	ADEQ	Ambient, Stream Ecosystem Monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
3 total and dissolved: antimony, beryllium, cadmium, copper, lead, and zinc 2-3 total and 0-2 dissolved: arsenic, boron, chromium, manganese, mercury, and selenium 1 dissolved nickel.	3 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3 <i>E. coli</i> bacteria, fluoride, total dissolved solids 2 turbidity 2 bottom deposits

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect all core parameters to represent at least 3 seasons during an assessment period.

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	6.0 mg/L	7/21/2008	5.54 mg/L	A&Ww is inconclusive. Only 1 exceedance in 7 samples (binomial).
<i>E. coli</i>	235 cfu/100 mL, SSM	7/16/2008	1120 cfu/100 mL	FBC is inconclusive. These exceedances occurred during flood flows.
		7/24/2008	313 cfu/100 mL	
Lead	15 ug/L	7/16/2008	21.4 ug/L	FBC is inconclusive. Only 1 exceedance in 4 samples (binomial).
SSC	80 mg/L	7/11/2008	1104 mg/L	A&Ww is attaining. All exceedances occurred during or within 48 hours after local storm events.
		7/16/2008	819 mg/L	
		7/21/2008	14684 mg/L	
Biocriteria	IBI ≥ 50 attaining IBI 40 - 49 inconclusive IBI ≤ 39 violating	4/6/2005	IBI 45	A&Ww is inconclusive.

Monitoring Summary

Sampling period: 8/16/2004 - 12/17/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At Highway 77 Bridge	SPARA000.28	105601	ADEQ	TMDL
At Woods Ranch	SPARA010.19	100212	ADEQ	Fixed Station Network, Biocriteria

Metals Samples	Nutrients & Related Samples	Other Samples
3-5 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, mercury, and zinc 5-7 total and 0-2 dissolved: boron, chromium, manganese, and selenium 1 total and 1 dissolved: barium, nickel, and silver	5-7 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	7 <i>E. coli</i> bacteria 5 fluoride 5 total dissolved solids 8 suspended sediment concentration 5 turbidity 1 biocriteria

San Pedro Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Dissolved oxygen (A&W), <i>E. coli</i> (FBC), lead (FBC), and biocriteria (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional dissolved oxygen, <i>E. coli</i> bacteria, and lead samples due to exceedances. Collect an additional macroinvertebrate sample to verify the bioassessment result. Use a lower lab detection limit for selenium.

Babocomari River

Banning Creek - San Pedro River
15050202-004
32.7 miles

Category 2
Attaining some uses

San Pedro

Use Support
A&Ww - Attaining • FBC - Inconclusive
AGL - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
<i>E. coli</i>	235 cfu/100 mL, SSM	8/17/2006	1414 cfu/100 mL	FBC is inconclusive. 1 single sample exceedance during the last 3 years of monitoring. Note: The sample was collected within 48 hours after a peak storm flow.
SSC	80 mg/L	8/7/2006	326 mg/L	A&Ww is attaining. 1 of 2 exceedances (8/17/06) occurred within 48 hours of a local storm event and was excluded from the median value determination. The median value of 5 remaining samples did not exceed the criterion.
		8/17/2006	3900 mg/L	

Monitoring Summary

Sampling period: 1/2/2004 - 11/4/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Near Tombstone, AZ, USGS 09471400	SPBBR003.49	101488	USGS	Ambient
Mouth Near Fairbank Townsite on Hwy 82	SPBBR000.06	103548	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
7 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 6-7 total metals only: boron, chromium, and manganese 5-7 total and 0-2 dissolved: mercury and selenium	3-5 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen 7 dissolved oxygen 8 pH	8 <i>E. coli</i> bacteria 5 fluoride 4 total dissolved solids 6 suspended sediment 8 turbidity

San Pedro Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	<i>E. coli</i> bacteria
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Lead (FBC) and selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional <i>E. coli</i> samples due to the exceedance and in support of San Pedro TMDL development. Use a lower lab detection limit for selenium. Ensure a lab reporting limit for lead is lower than the FBC criterion.

Bass Canyon Creek

Tributary at 322606 / 1101318 - Hot Springs Canyon Creek
15050203-899B
7.9 miles

Category 1
Attaining all uses

A&Ww - Attaining • FBC - Attaining • AGL - Attaining
FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	6.0 mg/L	9/14/2004	2.66 mg/L	A&Ww is attaining. Low dissolved oxygen due to low flow conditions (0.1 cfs).

Monitoring Summary

Sampling period: 9/14/2004 - 4/19/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Hot Springs Canyon Creek	SPBAS000.62	100217	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
4 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 4 total and 0-1 dissolved: boron, chromium, manganese, mercury, and selenium	4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria, fluoride, suspended sediment concentration, total dissolved solids, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Use a lower lab detection limit for selenium.

Bass Canyon Tributary

Headwaters - Bass Canyon Creek
15050203-935
1 mile

Category 1
Attaining all uses

A&Ww - Attaining • FBC - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	6.0 mg/L	4/21/2005	5.25 mg/L	A&Ww is attaining. Low dissolved oxygen due to low flow conditions (0.05 cfs).

Monitoring Summary

Sampling period: 9/16/2004 - 4/21/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
East of Bass Canyon	SPUBS000.22	100224	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
4 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 4 total and 0-1 dissolved: boron, chromium, manganese, mercury, and selenium	3-4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3-4 <i>E. coli</i> bacteria, fluoride, suspended sediment concentration, total dissolved solids, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Use a lower lab detection limit for selenium.

Copper (EPA, 2004 and ADEQ, 2006/2008)

A&We - Impaired • PBC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Copper ^d	10.3 ug/L at 42 mg/L hardness	8/14/2004	25 ug/L	A&We remains impaired.
	5.1 ug/L at 20 mg/L hardness	9/27/2004	30 ug/L	
Lead	15 ug/L	8/14/2004	380 ug/L	PBC is inconclusive. 1 exceedance in 2 samples (binomial).

Monitoring Summary
Sampling period: 8/14/2004 - 9/27/2004

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Mineral Zone	SPBRG001.03	103439	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
2 total and dissolved: cadmium, copper, lead, and zinc	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Lead (PBC)
Missing Core Parameters	pH (A&We, PBC)
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Conduct follow-up monitoring once copper TMDL and site specific copper standards are established. Collect lead samples due to the exceedance.

Impairment Discussion
Site specific standard (SSS) development is ongoing. TMDL will be developed once SSS had been determined.

Buehman Canyon Creek

Headwaters - end of designated Outstanding Arizona Water
15050203-010A
10.5 miles
Outstanding Arizona Water

Category 3
Inconclusive

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

No Exceedances

Monitoring Summary

Sampling period: 11/8/2004 - 4/4/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Bullock Canyon	SPBHC004.66	100425	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
2-3 total and dissolved: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, and zinc 2-3 total and 0-1 dissolved: boron, manganese, mercury, and selenium	3 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect all core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for selenium.

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Copper ^d	28 ug/L at 380 mg/L hardness	3/9/2005	31.1 ug/L	A&Ww chronic is inconclusive. Only 1 exceedance during the assessment period.

Monitoring Summary

Sampling period: 9/30/2004 - 4/5/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Dark Canyon	SPCOP008.37	100944	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
2-3 total and dissolved: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, and zinc 2-3 total and 0-1 dissolved: boron, manganese, mercury, selenium	3 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Dissolved copper
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional dissolved copper samples due to the exceedance. Collect core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for selenium.

Double R Canyon Creek

Headwaters - Bass Canyon Creek
15050203-902
5 miles

Category 1
Attaining all uses

A&Ww - Attaining • FBC - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	6.0 mg/L	9/15/2004	5.51 mg/L	A&Ww is attaining. Low dissolved oxygen due to low flow conditions (0.06 cfs).

Monitoring Summary

Sampling period: 9/15/2004 - 4/21/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Near Mouth	SPDOU000.18	100223	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
4 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 4 total and 0-1 dissolved: boron, chromium, manganese, mercury, and selenium	3-4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3-4 <i>E. coli</i> bacteria, fluoride, suspended sediment concentration, total dissolved solids, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Use a lower lab detection limit for selenium.

A&Wc - Inconclusive • FBC - Attaining • AGL - Attaining
DWS - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	7.0 mg/L	8/17/2004	4.56 mg/L	A&Wc is attaining. Low dissolved oxygen due to low flow and groundwater upwelling.

Monitoring Summary

Sampling period: 8/17/2004 - 12/16/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Post Creek	SPGRA007.71	100561	ADEQ	Ambient, Stream Ecosystem Monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
6 total and 3-6 dissolved: antimony, arsenic, beryllium, copper, lead, and mercury 6 total and 0-1 dissolved: boron, cadmium, chromium, manganese, selenium, and zinc	6 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	6 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity 1 bottom deposits

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	Dissolved cadmium and zinc (A&W).
Missing Seasonal Distribution	Dissolved cadmium and zinc (A&W).
Lab Detection Limits Not Low Enough	Dissolved metals (cadmium, copper, lead, and zinc) and total selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for the dissolved metals (cadmium, copper, lead, and zinc) and total selenium to determine attainment of A&W.

Greenbush DrawTributary at 312156 / 1100214 - Tributary at 312257 / 1100417
15050202-425
11.5 miles**Category 3**
Inconclusive

A&We - Inconclusive • PBC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
<i>E. coli</i>	576 cfu/100 mL, SSM	7/27/2006	691 cfu/100 mL	PBC is inconclusive. Only 1 exceedance during the last 3 years of monitoring. Note: This exceedance occurred during a storm event.
Lead	15 ug/L	7/27/2006	110 ug/L	PBC is inconclusive. Only 1 exceedance in 1 sampling event.

Monitoring Summary

Sampling period: 7/27/2006

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At HWY 92	SPGBD3.81	103546	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
1 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, and zinc 1 total only: boron, chromium, lead, manganese, mercury, and selenium	1 ammonia, nitrate, total nitrogen, phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	1 fluoride and suspended sediment concentration

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	<i>E. coli</i> and lead (PBC)
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Collect additional <i>E. coli</i> bacteria and lead samples due to exceedances. Collect core parameters to represent at least 3 seasons during an assessment period.

A&Ww - Inconclusive • FBC - Attaining • AGL - Attaining
FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Copper ^d	9.6 ug/L ^{chronic} , 14.4 ug/L ^{acute} at 108 mg/L hardness	4/19/2005	15 ug/L	A&Ww is inconclusive. Only 1 chronic exceedance in the assessment period.

Monitoring Summary

Sampling period: 9/14/2004 - 11/12/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Wildcat Canyon	SPHSC010.67	100574	ADEQ	Fixed Station Network/Ambient, Bio-criteria

Metals Samples	Nutrients & Related Samples	Other Samples
5 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 5 total and 0-2 dissolved: boron, chromium, manganese, mercury, and selenium	5 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	5 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity 1 biocriteria

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Dissolved copper (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium and dissolved lead (A&W)

Priority	Monitoring Recommendations
Medium	Collect copper samples due to the exceedance. Use lower lab detection limits for selenium and dissolved lead.



Leslie Creek

Headwaters - Whitewater Draw
15080301-007
24.5 miles

Category 3

Inconclusive

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	6.0 mg/L	8/18/2004	2.6 mg/L	A&Ww is attaining. Low dissolved oxygen due to low flow conditions (0.03 cfs).

Monitoring Summary

Sampling period: 8/18/2004 - 6/3/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At Leslie Canyon Natl Wildlife Refuge	SPLES012.75	101500	USGS and ADEQ	Ambient/Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
1-3 total and dissolved: antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, and zinc 1 total mercury 2-3 dissolved metals only: barium, nickel, selenium, silver, uranium	1-2 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	1 fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	<i>E. coli</i> bacteria (FBC)
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect core parameters to represent at least 3 seasons during an assessment period. Use a lower lab detection limit for selenium.

Miller Canyon

Headwaters - Broken Arrow Ranch
15050202-409A
4.3 miles

Category 1
Attaining all uses

San Pedro

A&Wc - Attaining • FBC - Attaining • AGL - Attaining
DWS - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	7.0 mg/L	3/30/2005	5.19 mg/L	A&Wc is attaining. Low dissolved oxygen due to a low flow (0.5 cfs).

Monitoring Summary

Sampling period: 12/16/2004 - 8/21/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
South of Carr Peak	SPMLC013.56	106505	ADEQ	Ambient
Near Headwaters	SPMLC012.43	100592	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
3 total and 2-3 dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, mercury, and zinc 1-3 total metals only: boron, chromium, manganese, and selenium	3 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	Use a lower lab detection limit for selenium.

Mule Gulch

Headwaters - Lavender Pit
15080301-090A
3 miles

Category 5
Impaired

IMPAIRMENT STATUS

Copper (1990)

A&Ww - Impaired • PBC - Inconclusive

FC - Inconclusive

Monitoring Summary

Sampling period: No current data in ADEQ's database

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Spring Canyon	SPMLG015.59	102773	ADEQ	TMDL
At Inn at Castle Rock	SPMLG014.59	100506	ADEQ	TMDL
At MG - 100	SPMLG014.03	102489	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
None	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	All designated uses
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Conduct follow-up monitoring once copper TMDL and site specific copper standards are established. Collect core parameters to represent at least 3 seasons during an assessment period.

Impairment Discussion
Site specific standard (SSS) development is ongoing. TMDL will be developed once SSS had been determined.

Mule Gulch

Lavender Pit - Bisbee WWTP discharge
15080301 - 090B
0.8 miles

Category 5
Impaired

San Pedro

Copper (1990) and low pH (EPA, 2002)

A&We - Impaired • PBC - Impaired

Monitoring Summary

Sampling period: No current data in ADEQ's database

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Site MG 150	SPMLG012.79	102490	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
None	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	All designated uses
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Conduct follow-up monitoring once copper TMDL and site specific copper standards are established. Collect core parameters to represent at least 3 seasons during an assessment period.

Impairment Discussion
Site specific standard (SSS) development is ongoing. TMDL will be developed once SSS had been determined.

Mule Gulch

Bisbee WWTP discharge - Highway 80 bridge
15080301 - 090C
3.8 miles

Category 5
Impaired

Copper, cadmium, zinc, and low pH (1990)

A&Wedw - Impaired • PBC - Impaired

Monitoring Summary

Sampling period: No current data in ADEQ's database

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At MG-200 B (new)	SPMLG010.61	102491	ADEQ	TMDL
Below Elfrida cutoff	SPMUG007.81	100225	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
None	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	All designated uses
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Conduct follow-up monitoring once copper TMDL and site specific copper standards are established. Collect core parameters to represent at least 3 seasons during an assessment period.

Impairment Discussion
Site specific standard (SSS) development is ongoing. TMDL will be developed once SSS had been determined.

A&We - Inconclusive • PBC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Lead	15 ug/L	8/14/2004	470 ug/L	PBC is inconclusive. 1 exceedance in the only sample collected (binomial).

Monitoring Summary

Sampling period: 8/14/2004

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Highway 80	SPMHC000.09	103440	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
1 total and dissolved: copper, lead, and zinc 1 dissolved cadmium	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Lead (PBC)
Missing Core Parameters	pH (A&We, PBC)
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Low	Collect lead samples due to the exceedance. Collect core parameters to represent at least 3 seasons during an assessment period.

Ramsey Canyon

Headwaters - Forest road 110
15050202-404A
4.4 miles

Category 2
Attaining some uses

A&Wc - Inconclusive • FBC - Attaining • AGL - Attaining
AGI - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Mercury ^d	0.010 µg/L	2/23/2005	0.055 µg/L	A&Wc chronic is inconclusive. Only 1 exceedance during the assessment period.

Monitoring Summary

Sampling period: 12/16/2004 - 12/4/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Nature Conservancy Buildings	SPRMC011.48	100625	ADEQ	Fixed Station Network
At Box Canyon	SPRMC011.11	101060	ADEQ	Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
6 total and 3-6 dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, mercury, and zinc 6 total metals only: boron, chromium, manganese, and selenium 1 dissolved nickel	6 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	5-6 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Dissolved mercury (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional dissolved mercury samples due to the exceedance. Use a lower lab detection limit for selenium.

Redfield Canyon

Tributary at 323339 / 1101841 - San Pedro River
15050203-014B
32.5 miles

Category 3
Inconclusive

San Pedro

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

No Exceedances

Monitoring Summary

Sampling period: 4/20/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Sycamore Canyon	SPRDC012.76	100628	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
1 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 1 total only: boron, chromium, manganese, mercury, and selenium	1 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	1 E. coli bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium, dissolved copper, and dissolved lead (A&W)

Priority	Monitoring Recommendations
Low	Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for selenium and dissolved metals (copper and lead).

A&Wc - Inconclusive • FBC - Attaining • AGL - Attaining
 FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	7.0 mg/L	6/16/2005	5.5 mg/L	A&Wc is attaining. Low dissolved oxygen due to low flow conditions (0.07 cfs).
Biocriteria	IBI ≥ 52 attaining IBI 46 - 51 inconclusive IBI ≤ 45 violating	6/16/2005	IBI 49	A&Wc is inconclusive.

Monitoring Summary

Sampling period: 8/18/2004 - 6/16/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Campground	SPRUC007.81	100938	ADEQ	Fixed Station Network, Biocriteria, Stream Ecosystem Monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
4 total and dissolved: antimony, arsenic, and beryllium 4 total and 0-2 dissolved: boron, cadmium, chromium, copper, lead, manganese, mercury, and zinc	4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3-4 <i>E. coli</i> , fluoride, total dissolved solids, suspended sediment concentration, and turbidity 1 biocriteria 1 bottom deposits

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Biocriteria (A&W)
Missing Core Parameters	Dissolved cadmium, copper, and zinc (A&W).
Missing Seasonal Distribution	Dissolved cadmium, copper, and zinc (A&W).
Lab Detection Limits Not Low Enough	Dissolved metals (cadmium, copper, lead, zinc) and selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect an additional macroinvertebrate sample to verify the bioassessment result. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for the dissolved metals (cadmium, copper, lead, and zinc) and selenium.

A&Ww - Inconclusive • FBC - Inconclusive • AGI - Inconclusive
 AGL - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Lead	15 ug/L (FBC)	2/15/2005	20 ug/L	FBC is inconclusive. Only 1 exceedance in 1 sample (binomial).
Mercury ^d	0.010 ug/L	2/15/2005	0.0104 ug/L	A&Ww chronic is attaining. This exceedance occurred during a storm event and does not represent chronic conditions.
SSC	80 mg/L	2/15/2005	483 mg/L	A&Ww is attaining. This exceedance occurred during a storm event and was excluded from assessment.

Monitoring Summary

Sampling period: 9/14/2004 - 11/19/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Apache Nitrogen Contamination Area	SPSPR100.16	103662	Apache Nitrogen Products, Inc	
Below Confluence With Dragoon Wash	SPSPR101.10	102712	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
1 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, mercury, and zinc 1 total only: boron, chromium, manganese, and selenium	1 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen 10 nitrate 1 pH and dissolved oxygen	1 E. coli bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity

San Pedro Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Lead (FBC)
Missing Core Parameters	All designated uses
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Low	<p>Collect additional lead samples due to the exceedance.</p> <p>Use a lower lab reporting limit for selenium.</p> <p>Collect core parameters to represent at least 3 seasons during an assessment period.</p> <p>No longer impaired for nitrate (the site specific standard was repealed in 2009).</p>

E. coli (2004)
IMPAIRMENT STATUS
A&Ww - Inconclusive • FBC - Impaired
AGL - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Arsenic	30 ug/L	7/27/2006	79 ug/L	FBC is inconclusive. 2 exceedances in 9 samples (binomial).
		8/17/2006	63 ug/L	
Copper	500 ug/L	8/17/2006	580 ug/L	AGL is attaining. Only 1 exceedance in 10 samples (binomial).
Dissolved oxygen	6.0 mg/L	8/30/2006	3.13 mg/L	A&Ww is attaining. 2 exceedances in 11 samples (binomial).
		4/12/2007	4.21 mg/L	
E. coli	235 cfu/100 mL, SSM	2/1/2006	579 CFU/100 mL	FBC remains impaired. 4 exceedances during the last 3 years of monitoring.
		7/27/2006	2420 CFU/100 mL	
		8/17/2006	2420 CFU/100 mL	
		4/12/2007	308 CFU/100 mL	
Lead	15 ug/L (FBC), 100 ug/L (AGL)	7/27/2006	220 ug/L	FBC and AGL are inconclusive. 2 exceedances in 6 samples for FBC and 9 samples for AGL (binomial). Note: The lab reporting limit was higher than the FBC criterion in 3 samples.
		8/17/2006	240 ug/L	
SSC	80 mg/L	7/27/2006	13380 mg/L	A&Ww is inconclusive - 3 single sample exceedances (7/27, 8/7, and 8/17) occurred during storm events and were excluded from assessment. Not enough samples left calculate a median.
		8/7/2006	695 mg/L	
		8/17/2006	5100 mg/L	
		8/30/2006	282 mg/L	
		12/6/2006	173 mg/L	
Selenium	2.0 ug/L	7/13/2006	20 ug/L	A&Ww chronic is inconclusive. One of the exceedances is very close to the detection limit (2 ug/L). They are also storm related and may not represent chronic conditions.
		8/17/2006	2.1 ug/L	

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Spring West Bank	SPSPR101.83	100279	Apache Nitrogen Products, Inc	Effectiveness monitoring
Apache Nitrogen Contamination Area	SPSPR104.15	103661	Apache Nitrogen Products, Inc	Effectiveness monitoring
16065 Meters Below Escalante Crossing	SPSPR102.54	103665	Apache Nitrogen Products, Inc	Effectiveness monitoring
20180 Below Escalante Crossing	SPSPR101.75	103670	Apache Nitrogen Products, Inc	Effectiveness monitoring
20500 Meters Below Escalante Crossing	SPSPR101.72	103671	Apache Nitrogen Products, Inc	Effectiveness monitoring
0.8 Miles South of Highway 80	SPSPR102.01	100281	ADEQ	Fixed Station Network
At Escalante Crossing	SPSPR105.49	103674	ADEQ	TMDL
Near Tombstone, AZ, USGS 09471550	SPSPR115.90	101490	USGS	Ambient
At Fairbanks, AZ	SPSPR117.97	100287	ADEQ	TMDL
NORTH OF HIGHWAY 80	SPSPR101.25	100276	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
19-20 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 16-20 total and 0-5 dissolved: boron, chromium, manganese, mercury, and selenium 3 barium	5-11 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen 70 nitrate samples 29 pH 24 dissolved oxygen	24 <i>E. coli</i> bacteria 18 fluoride 10 total dissolved solids 19 suspended sediment

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Arsenic (FBC), lead (FBC), suspended sediment and selenium (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Arsenic, lead (FBC); selenium, dissolved copper, and dissolved mercury (A&W chronic)

Priority	Monitoring Recommendations
High	Collect <i>E. coli</i> samples in support of TMDL development. Collect additional arsenic, lead, suspended sediment, and selenium samples due to exceedances.

Impairment Discussion
None

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • AGI - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
<i>E. coli</i>	235 CFU/100 mL	8/17/2006	2420 CFU/100 mL	FBC is inconclusive. 1 single sample exceedance in the last 3 years of monitoring. Note: This exceedance occurred during a flood flow.
Lead	15 ug/L (FBC), 100 ug/L (AGL)	8/17/2006	120 ug/L	FBC and AGL are inconclusive. Only 1 exceedance in 2-3 samples (binomial). Note: The lab reporting limit was higher than the FBC criterion in 1 sample.
SSC	80 mg/L	8/17/2006	2800 mg/L	A&Ww is inconclusive. This exceedance occurred during or within 48 hours of a local storm event. Insufficient number of samples to calculate a median.
Bottom deposits	< 50% fines	12/18/2008	52%	A&Ww is inconclusive. Only 1 exceedance during the assessment period.

Monitoring Summary

Sampling period: 2/1/2006 - 12/18/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Boquillas Ranch	SPSPR120.47	104005	ADEQ	TMDL
Below Graveyard Gulch	SPSPR126.35	100653	ADEQ	Ambient, Stream Ecosystem Monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
3 total and 1-3 dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, selenium, and zinc 2-3 total metals only: boron, chromium, manganese, and mercury 1 barium	2 dissolved oxygen 4 pH	3 <i>E. coli</i> bacteria 1 fluoride 1 total dissolved solids 3 suspended sediment 3 turbidity 1 bottom deposits

San Pedro Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	<i>E. coli</i> (FBC); lead (FBC, AGL); suspended sediment and bottom deposits (A&Ww)
Missing Core Parameters	None
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	Lead and arsenic (FBC), dissolved mercury and dissolved cadmium (A&W chronic)

Priority	Monitoring Recommendations
Medium	Collect <i>E. coli</i> , lead, suspended sediment, and bottom deposits samples due to exceedances. Use lower reporting limits for lead, arsenic, dissolved mercury, and dissolved cadmium.

Add E. coli and copper to the 303(d) list.

A&Ww - Impaired • FBC - Impaired • AGL - Inconclusive
AGI - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Arsenic	30 ug/L (FBC) and 80 ug/L (FC)	8/19/2004	36 ug/L	FBC and FC are attaining. 2 exceedances and 1 exceedance respectively in 13 samples (binomial).
		7/27/2006	110 ug/L	
Copper	500 ug/L (AGL) and 1300 ug/L (FBC)	8/19/2004	953 ug/L	AGL is inconclusive with 3 exceedances in 14 samples (binomial). FBC is attaining with 1 exceedance in 14 samples (binomial).
		7/5/2006	555 ug/L	
		7/26/2006	3152 ug/L	
Copper ^d	49.6 ug/L @ > 400 mg/L hardness	7/5/2006	180 ug/L	A&Ww acute is impaired. 2 exceedances in the last 3 years of monitoring.
	27.0 ug/L @ 210 mg/L hardness	7/26/2006	37 ug/L	
	29.3 ug/L at 400 mg/L hardness	7/26/2006	32 ug/L (median)	A&Ww chronic is attaining. This exceedance occurred during a local storm event and does not represent chronic conditions.
Dissolved oxygen	6.0 mg/L	7/27/2006	4.4 mg/L	A&Ww is attaining. Only 2 exceedances in 29 samples (binomial).
		8/30/2006	5.76 mg/L	
E. coli	235 cfu/100 mL, SSM	4/14/2004	2320 cfu/100 mL	FBC is impaired. 2 exceedances during the last 3 years of monitoring. Note: These exceedances occurred during flood flows.
		8/19/2004	35000 cfu/100 mL	
		7/27/2006	2420 cfu/100 mL	
		8/17/2006	2420 cfu/100 mL	
Lead	15 ug/L (FBC) and 100 ug/L (AGL)	8/19/2004	230 ug/L	AGL is attaining. Only 2 exceedances in 13 samples (binomial). FBC is inconclusive. 3 exceedances in 10 samples (binomial). Note: The lab reporting limit was higher than the FBC criterion in 3 samples.
		7/27/2006	195 ug/L	
		8/17/2006	90 ug/L	
SSC	80 mg/L	7/15/2004	138 mg/L	A&Ww is inconclusive. All exceedances except on 8/7/06 and 7/31/2008 occurred during local storm events and were excluded from assessment. Insufficient number of samples left to calculate a median (a minimum of 4 samples is required).
		8/19/2004	6830 mg/L	
		7/5/2006	4126 mg/L	
		7/26/2006	10610 mg/L	
		8/7/2006	208 mg/L	
		8/17/2006	2160 mg/L	
		7/31/2008	188 mg/L	

Monitoring Summary

Sampling period: 1/3/2004 - 11/5/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Highway 90	SPSPR134.35	100288	ADEQ	TMDL
Near Hereford Road, AZ USGS	SPSPR144.76	101497	ADEQ, USGS	TMDL, Ambient
At Palominas, AZ USGS 09470500	SPSPR150.09	100275	ADEQ, USGS	TMDL, Ambient
At Charleston, AZ USGS 09471000	SPSPR127.50	100291	ADEQ, USGS	TMDL, Ambient
At Route 90, Near Lewis Springs USGS	SPSPR134.32	101499	USGS	Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
22-26 dissolved and total: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 8-26 total and 0-6 dissolved: barium, boron, chromium, manganese, mercury, and selenium	12-18 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen 40-41 dissolved oxygen and pH	28 <i>E. coli</i> bacteria 13 fluoride 8 total dissolved solids 23 turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Copper (AGL), lead (FBC) and suspended sediment (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Lead (FBC) and selenium (A&W)

Priority	Monitoring Recommendations
High	Collect additional <i>E. coli</i> and dissolved copper samples in support of TMDL development. Use a lower lab detection limit for selenium. Ensure a lab reporting limit for lead is lower than the FBC criterion.

Impairment Discussion
None

IMPAIRMENT STATUS

E. coli (2004)
A&Ww - Attaining • FBC - Impaired • AGL - Inconclusive
FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Arsenic	30 ug/L (FBC) and 80 ug/L (FC)	8/19/2008	160 ug/L	FBC and FC are attaining. 1 exceedance in 10 samples (binomial).
Copper	500 ug/L	8/16/2004	930 ug/L	AGL is inconclusive. 2 exceedances in 9 samples (binomial).
Dissolved oxygen	6.0 mg/L	7/21/2008	5.16 mg/L	A&Ww is attaining. 1 exceedance in 15 samples (binomial).
<i>E. coli</i>	235 cfu/100 mL, SSM	1/15/2004	740 cfu/100 mL	FBC remains impaired. 4 single sample exceedances during the last 3 years of monitoring. Note: Samples collected on 7/16/08 and 7/21/08 are less than 7 days apart, but they fall under different aggregated weeks and are considered as 2 independent samples.
		8/16/2004	4100 cfu/100 mL	
		7/16/2008	961 cfu/100 mL	
		7/21/2008	36294 cfu/100 mL	
		7/31/2008	921 cfu/100 mL	
		8/19/2008	5900 cfu/100 mL	
	126 cfu/100 mL, Geometric mean	7/16/2008 - 7/31/2008	4433 cfu/100 mL	
Lead	15 ug/L (FBC) and 100 ug/L (AGL)	8/16/2004	980 ug/L	FBC and AGL are inconclusive. 3 exceedances for FBC and 2 exceedances for AGL in 9 samples (binomial).
		7/16/2008	34.6 ug/L	
		8/19/2008	610 ug/L	
SSC	80 mg/L	8/16/2004	29600 mg/L	A&Ww is attaining - 3 out of 6 exceedances (8/16/04, 7/16/08, and 7/21/08) occurred during or within 48 hours of storm events and were excluded from the median value determination. The median values determined from remaining samples did not exceed the standard.
		7/16/2008	1959 mg/L	
		7/21/2008	67319 mg/L	
		7/31/2008	1610 mg/L	
		8/19/2008	13200 mg/L	
		12/17/2008	206 mg/L	

Monitoring Summary

Sampling period: 1/15/2004 - 12/17/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Confluence With Swingle Wash	SPSPR006.27	106322	ADEQ	TMDL
Above Roach Wash	SPSPR003.85	101348	ADEQ	TMDL
Above Confluence With Romero Wash	SPSPR001.54	106563	ADEQ	TMDL
Below Eskiminzin Wash	SPSPR005.28	100726	ADEQ	Fixed Station Network
Above Dodson Wash	SPSPR006.75	106483	ADEQ	Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
6-12 total and 8-12 dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, mercury, and zinc 8-11 total and 1-4 dissolved: boron, chromium, and manganese. 3-4 total and dissolved: barium, silver, and nickel 19 selenium	9-12 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen 19 dissolved oxygen and pH	19 <i>E. coli</i> bacteria 12 fluoride 12 total dissolved solids 19 suspended sediment 14 turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Arsenic (FBC), copper (AGL), and lead (FBC, AGL)
Missing Core Parameters	All core parameters were collected.
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
High	Collect additional <i>E. coli</i> samples in support of TMDL development. Collect additional arsenic, copper, and lead samples due to exceedances. The old mercury standard (0.60 ug/L) was exceeded in 1 of 6 samples (8/19/08 0.62 ug/L). Recommend collecting fish tissue samples. Use a lower lab detection limit for selenium.

Impairment Discussion
Delist selenium from the 303(d) list. To be no longer impaired, new data must indicate that the A&W designated use is attaining during critical conditions. Critical conditions for selenium usually include low flow conditions. Five new samples were collected during baseflow conditions between 0.97-14 cfs, with no exceedances. Therefore, it is determined that A&W is no longer impaired.

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Arsenic	30 µg/L	7/21/2008	56 µg/L	FBC is inconclusive. Only 1 exceedance in 4 samples (binomial).
Copper	1300 µg/L (FBC) and 500 µg/L (AGL)	7/21/2008	2360 µg/L	FBC and AGL are inconclusive. Only 1 exceedance in 4 samples (binomial).
Copper ^d	6.6 µg/L ^{chronic} , 9.6 µg/L ^{acute} at 70 mg/L hardness	1/5/2005	16 µg/L	A&Ww is inconclusive. Only 1 chronic exceedance in the assessment period.
Dissolved oxygen	6.0 mg/L	7/21/2008	5.31 mg/L	A&Ww is inconclusive. Only 1 exceedance in 5 samples (binomial).
<i>E. coli</i>	235 cfu/100 mL, SSM	7/21/2008	36294 cfu/100 mL	FBC is inconclusive. 1 single sample exceedance in the last 3 years of monitoring. Note: This sample was collected during a storm event.
Lead	15 µg/L (FBC) and 100 µg/L (AGL)	1/5/2005	84 µg/L	FBC and AGL are inconclusive. 1 exceedance for AGL and 2 exceedances for FBC in 4 samples (binomial).
		7/21/2008	3580 µg/L	
Mercury ^d	0.010 µg/L	7/21/2008	0.0116 µg/L	A&Ww chronic is attaining. 1 exceedance occurred during a local storm event. This value does not represent chronic conditions.
SSC	80 mg/L	1/24/2008	90 mg/L	A&Ww is attaining. 2 out of 3 exceedances (7/11/08 and 7/21/08) occurred during or within 48 hours of local storm events and were excluded from the median value determination. The median value determined from 4 remaining samples did not exceed the standard.
		7/11/2008	14512 mg/L	
		7/21/2008	71506 mg/L	

Monitoring Summary

Sampling period: 1/15/2004-12/17/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Aravaipa Creek	SPSPR013.99	105600	ADEQ	TMDL
At Aravaipa Creek	SPSPR013.38	106164	ADEQ	TMDL
At Highway 77 Near Mammoth	SPSPR022.15	105599	ADEQ	TMDL
At Mammoth	SPSPR023.77	103481	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
1-5 total and dissolved: antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc 7 total selenium	2-4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, and total Kjeldahl nitrogen 5-6 dissolved oxygen and pH	3-6 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Arsenic and <i>E. coli</i> (FBC); copper and lead (FBC, AGL); dissolved oxygen (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium and dissolved mercury (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional arsenic, copper, lead, <i>E. coli</i> , and dissolved oxygen samples due to exceedances. Use a lower lab detection limit for selenium and dissolved mercury.



San Pedro River
Buehman Wash - Peppersauce Wash
15050203-008
16.4 miles

Category 3
Inconclusive

San Pedro

A&Ww - Inconclusive • FBC - Inconclusive
AGL - Inconclusive • FC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Arsenic	30 ug/L (FBC) and 80 ug/L (FC)	8/19/2008	190 ug/L	FBC and FC are inconclusive. 1 exceedance in 6 samples (binomial).
Copper	500 ug/L	8/17/2004	1100 ug/L	AGL is inconclusive. 1 exceedance in 6 samples (binomial).
Dissolved oxygen	6.0 mg/L	8/19/2008	5.03 mg/L	A&Ww is inconclusive. 1 exceedance in 6 samples (binomial).
<i>E. coli</i>	235 cfu/100 mL	8/17/2004	4000 cfu/100 mL	FBC is inconclusive. Only 1 exceedance in the last 3 years of monitoring.
		8/19/2008	4900 cfu/100 mL	
Lead	15 ug/L (FBC) and 100 ug/L (AGL)	8/17/2004	620 ug/L	FBC and AGL are inconclusive. 3 exceedances for FBC and 2 exceedances for AGL in 6 samples (binomial).
		1/5/2005	84 ug/L	
		8/19/2008	740 ug/L	
SSC	80 mg/L	8/17/2004	46400 mg/L	A&Ww is inconclusive. The exceedance on 8/17/04 occurred within 48 hours of a peak storm flow and was excluded from the median value determination. The remaining data was insufficient to calculate a median value.
		8/19/2008	13600 mg/L	
Selenium	2.0 ug/L	8/19/2008	12 ug/L	A&Ww chronic is inconclusive. 1 exceedance during the assessment period. Note: Lab detection limit was above the A&W chronic criterion in all other samples.

Monitoring Summary

Sampling period: 8/17/2004 - 12/10/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Near San Manuel	SPSPR034.66	101843	ADEQ	TMDL
At Valley Road, Near San Manuel	SPSPR035.01	100285	ADEQ	Fixed Station Network, Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
7-8 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 7-8 total and 0-4 dissolved: boron, chromium, manganese, mercury and selenium 1 dissolved nickel	6-8 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, pH, and dissolved oxygen	6-7 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Arsenic (FBC, FC); <i>E. coli</i> (FBC); copper (AGL); lead (FBC, AGL); selenium, dissolved oxygen, dissolved copper, and suspended sediment (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional arsenic, copper, lead, selenium, <i>E. coli</i> , dissolved oxygen, and suspended sediment samples due to exceedances. The old mercury standard (0.60 ug/L) was exceeded in 1 of 6 samples (8/19/08 0.74 ug/L). Recommend collecting fish tissue samples. Use a lower lab detection limit for selenium.



San Pedro River
Hot Springs Creek - Redfield Canyon
15050203-011
16.0 miles

Category 2
Attaining some uses

San Pedro

A&Ww - Inconclusive • FBC - Inconclusive
AGI - Inconclusive • AGL - Inconclusive • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Copper	500 ug/L	8/19/2004	900 ug/L	AGL is inconclusive. Only 1 exceedance in 4 samples (binomial).
Copper ^d	23 ug/L at 300 mg/L hardness	4/5/2005	25 ug/L	A&Ww chronic is inconclusive. Only 1 exceedance in the assessment period.
<i>E. coli</i>	235 cfu/100 mL, SSM	8/19/2004	1000 cfu/100 mL	FBC is attaining. Only 1 single sample exceedance outside the analysis window (last 3 years of monitoring).
Lead	15 ug/L (FBC) and 100 ug/L (AGL)	8/19/2004	620 ug/L	FBC and AGL are inconclusive. Only 1 exceedance in 4 samples (binomial).
Manganese	10000 ug/L	8/19/2004	15000 ug/L	AGI is inconclusive. Only 1 exceedance in 5 samples (binomial).
SSC	80 mg/L	8/19/2004	16880 ug/L	A&Ww is attaining. The exceedance occurred within 48 hours of a peak storm flow and was excluded from the median value determination. The median value of remaining samples did not exceed the criterion.

Monitoring Summary

Sampling period: 1/15/2004 - 4/5/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
At Cascabel, AZ	SPSPR059.21	100289	ADEQ	Fixed Station Network

Metals Samples	Nutrients & Related Samples	Other Samples
3-5 total and dissolved: antimony, arsenic, beryllium, cadmium, copper, lead, and zinc 4-5 total and 0-2 dissolved: boron, chromium, manganese, mercury, and selenium	5 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, pH, and dissolved oxygen	5 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment concentration, and turbidity

San Pedro Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Copper (AGL), lead (FBC, AGL), manganese (AGI), and dissolved copper (A&W)
Missing Core Parameters	None
Missing Seasonal Distribution	None
Lab Detection Limits Not Low Enough	Selenium (A&W)

Priority	Monitoring Recommendations
Medium	Collect additional copper, lead, and manganese samples due to exceedances. Use a lower lab detection limit for selenium.

San Pedro River

HUC boundary 15050203 - Hot Springs Canyon Creek
15050203-012
17.1 miles

Category 3
Inconclusive

San Pedro

A&Ww - Inconclusive • FBC - Inconclusive
AGI - Inconclusive • AGL - Inconclusive • FC - Inconclusive

No Exceedances

Monitoring Summary

Sampling period: 3/26/2004 - 11/29/2004

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
3 Links 5 Gap	SPSPR071.62	102388	319 Grant/ADEQ	Effectiveness monitoring
3 Links North Field	SPSPR074.25	102390	319 Grant/ADEQ	Effectiveness monitoring
3 Links River Camp	SPSPR075.41	102391	319 Grant/ADEQ	Effectiveness monitoring
3 Links Upstream Crossing	SPSPR072.40	102389	319 Grant/ADEQ	Effectiveness monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
None	3 total nitrogen, total phosphorus, and total Kjeldahl nitrogen 5 pH and dissolved oxygen	1 <i>E. coli</i> bacteria 4 total dissolved solids 5 turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	All designated uses
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Low	Collect all core parameters to represent at least 3 seasons during an assessment period.

Turkey Creek

Headwaters - Rock Creek
15050201-002A
13.9 miles

Category 2

Attaining some uses

A&Wc - Inconclusive • FBC - Attaining • AGI - Attaining
AGL - Attaining • FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	7.0 mg/L	6/15/2005	3.24 mg/L	A&Wc is attaining. Low dissolved oxygen due to low flow and groundwater upwelling.

Monitoring Summary

Sampling period: 8/17/2004 - 6/15/2005

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Above Upper Camp-ground	SPTUR028.53	102113	ADEQ	Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
4 total and dissolved: antimony, arsenic, and beryllium 4 total and 0-2 dissolved: boron, cadmium, chromium, copper, lead, manganese, mercury, selenium, and zinc	4 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	Dissolved cadmium and zinc (A&W)
Missing Seasonal Distribution	Dissolved cadmium and zinc (A&W)
Lab Detection Limits Not Low Enough	Dissolved metals (cadmium, copper, lead, and zinc) and total selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect all core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved metals and selenium.

A&Ww - Inconclusive • FBC - Inconclusive
FC - Inconclusive**No Exceedances****M**onitoring Summary
Sampling period: 6/29/2005 - 6/3/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Mid Lake	SPTWP-USGS	101581	USGS	Ambient

Metals Samples	Nutrients & Related Samples	Other Samples
1-2 dissolved: antimony, arsenic, barium, boron, cadmium, chromium, copper, lead, manganese, nickel, sele- nium, silver, uranium, and zinc	1-2 ammonia (dissolved), nitrite/nitrate (dissolved), total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	1-2 fluoride, total dissolved solids, and turbidity

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	N/A
Missing Core Parameters	<i>E. coli</i> bacteria (FBC)
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Low	Collect core parameters to represent at least 3 seasons during an assessment period.

A&Wc - Inconclusive • FBC - Attaining • AGL - Attaining
 FC - Attaining

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Dissolved oxygen	7.0 mg/L	6/15/2005	6.03 mg/L	A&Wc is attaining - Low dissolved oxygen due to low flow and groundwater upwelling.
		9/8/2008	6.8 mg/L	

Monitoring Summary

Sampling period: 8/17/2004 - 11/10/2008

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Below Saulsbury Canyon	SPWRC000.09	102892	ADEQ	Ambient, Biocriteria, Stream Ecosystem Monitoring

Metals Samples	Nutrients & Related Samples	Other Samples
6 dissolved and total: antimony, arsenic, and beryllium 6 total and 0-2 dissolved: boron, cadmium, chromium, copper, lead, manganese, mercury, selenium, and zinc	6 ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	6 <i>E. coli</i> bacteria, fluoride, total dissolved solids, suspended sediment, and turbidity 1 biocriteria 2 bottom deposits

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	None
Missing Core Parameters	Dissolved cadmium and zinc (A&W).
Missing Seasonal Distribution	Dissolved cadmium and zinc (A&W).
Lab Detection Limits Not Low Enough	Dissolved metals (cadmium, copper, lead, and zinc) and total selenium (A&W)

Priority	Monitoring Recommendations
Low	Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for the dissolved metals (cadmium, copper, lead, and zinc) and selenium.

A&We - Inconclusive • PBC - Inconclusive

Exceedances

Parameter	Applicable Standard	Date & Result		Designated use support, supporting evidence, comments
Copper ^d	12.1 ug/L at 50 mg/L hardness	9/28/2004	47 ug/L	A&We is inconclusive. 1 exceedance in the assessment period. No additional samples collected in the last 3 years of monitoring.

Monitoring Summary

Sampling period: 9/28/2004

Site Name(s)	Site ID #	DEQ #	Sampling Agency	Purpose
Tributary from Mural Hill Above Mineralized Zone	SPWNC000.67	102926	ADEQ	TMDL

Metals Samples	Nutrients & Related Samples	Other Samples
1 total and dissolved: copper, lead, and zinc 1 dissolved cadmium	None	None

Data Gaps and Monitoring Needs

Exceedances Needing More Samples to Assess	Copper
Missing Core Parameters	pH (A&We, PBC)
Missing Seasonal Distribution	All designated uses
Lab Detection Limits Not Low Enough	N/A

Priority	Monitoring Recommendations
Medium	Conduct follow-up monitoring once copper TMDL on Mule Gulch and site specific copper standards are established. Collect all core parameters to represent at least 3 seasons during an assessment period.