

## NOTICES OF PUBLIC INFORMATION

Notices of Public Information contain corrections that agencies wish to make to their notices of rulemaking; miscellaneous rulemaking information that does not fit into any other category of notice; and other types of information required by statute to be published in the *Register*. Because of the variety of material that is contained in a Notice of Public Information, the Office of the Secretary of State has not established a specific format for these notices.

### NOTICE OF PUBLIC INFORMATION

#### DEPARTMENT OF HEALTH SERVICES ADMINISTRATION

[M13-40]

- 1. Title and its heading:** 9, Health Services  
**Chapter and its heading:** 1, Department of Health Services - Administration

**2. The public information relating to the listed Section:**

Arizona Revised Statutes (A.R.S.) § 36-405 requires the Department to adopt rules to “establish minimum standards and requirements for the construction, modification and licensure of health care institutions necessary to ensure public health, safety and welfare.” The Department has implemented A.R.S. § 36-405 in *Arizona Administrative Code* (A.A.C.) R9-1-412. The Department uses R9-1-412, which contains as incorporations by reference physical plant health and safety codes and standards, when reviewing architectural plans and specifications for construction or modification of health care institutions under A.R.S. § 36-406. Laws 2011, Ch. 96, § 1 requires the Department to adopt rules regarding health care institutions that reduce monetary or regulatory costs on persons or individuals. The physical plant health and safety codes and standards currently in rule are outdated and may conflict with more current codes used by local jurisdictions, with which a health care institution must also comply. The Department is revising R9-1-412 to reduce the number of incorporated physical plant health and safety codes and standards and update the remaining physical plant health and safety codes and standards. These changes should reduce the regulatory burden on health care institutions undergoing construction or modification of their physical plant. The Department has drafted an amended R9-1-412 6 and has posted the draft rule on the Department web site ([http://www.azdhs.gov/diro/admin\\_rules/physical-plant.htm](http://www.azdhs.gov/diro/admin_rules/physical-plant.htm)). This Notice of Public Information provides notice that the Department has posted the draft rule and is soliciting comments from interested persons.

**3. The name, address, and telephone number of agency personnel to whom questions and comments on the rules may be addressed:**

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**4. The web site where persons may obtain information about the rulemaking:**

[http://www.azdhs.gov/diro/admin\\_rules/physical-plant.htm](http://www.azdhs.gov/diro/admin_rules/physical-plant.htm)

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DEPARTMENT OF HEALTH SERVICES  
HEALTH CARE INSTITUTIONS: LICENSING

[M13-41]

- 1. Title and its heading:** 9, Health Services  
**Chapter and its heading:** 10, Department of Health Services - Health Care Institutions: Licensing

**2. The public information relating to the listed Section:**

Arizona Revised Statutes (A.R.S.) §§ 36-132(A)(17) and 36-405 authorize the Department to license and regulate health care institutions. A.R.S. § 36-405 further authorizes the Department to classify and subclassify health care institutions. The Department has implemented A.R.S. §§ 36-132(A)(17) and 36-405 in *Arizona Administrative Code* (A.A.C.) Title 9, Chapter 10. Laws 2011, Ch. 96, § 1 requires the Department to adopt rules regarding health care institutions that reduce monetary or regulatory costs on persons or individuals and facilitate licensing of “integrated health programs that provide both behavioral and physical health services.” The Department has reviewed the rules in 9 A.A.C. 10 and is revising these rules to comply with Laws 2011, Ch. 96, statutory changes, and current practice, as well as to provide consistency within the health care institution rules. The Department is also establishing new classes of health care institutions for those health care institutions currently licensed under 9 A.A.C. 20 and adding rules in 9 A.A.C. 10 for these classes of health care institutions. The Department has drafted amended rules for health care institutions currently licensed under 9 A.A.C. 10 and new Articles for the new classes of health care institutions, and has posted the draft rules on the Department web site ([http://www.azdhs.gov/diro/admin\\_rules/healthcare-institution.htm](http://www.azdhs.gov/diro/admin_rules/healthcare-institution.htm)). This Notice of Public Information provides notice that the Department has posted the draft rules and is soliciting comments from interested persons.

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**4. The web site where persons may obtain information about the rulemaking:**

[http://www.azdhs.gov/diro/admin\\_rules/healthcare-institution.htm](http://www.azdhs.gov/diro/admin_rules/healthcare-institution.htm)

**NOTICE OF PUBLIC INFORMATION**

**DEPARTMENT OF HEALTH SERVICES  
BEHAVIORAL HEALTH SERVICE AGENCIES: LICENSURE**

[M13-42]

- 1. Title and its heading:** 9, Health Services  
**Chapter and its heading:** 20, Department of Health Services - Behavioral Health Service Agencies: Licensure

**2. The public information relating to the listed Section:**

Arizona Revised Statutes (A.R.S.) §§ 36-132(A)(17) and 36-405 authorize the Department to license and regulate health care institutions. A.R.S. § 36-405 further authorizes the Department to classify and subclassify health care institutions. *Arizona Administrative Code* (A.A.C.) Title 9, Chapter 20 contains the Department's licensing requirements for behavioral health service agencies, a class of health care institution. Laws 2011, Ch. 96, § 1 requires the Department to adopt rules regarding health care institutions that reduce monetary or regulatory costs on persons or individuals and facilitate licensing of "integrated health programs that provide both behavioral and physical health services." The Department has reviewed the rules in 9 A.A.C. 20 and, to comply with requirements in Laws 2011, Ch. 96, is reclassifying health care institutions currently licensed under 9 A.A.C. 20 and establishing the rules for the new classes of health care institutions in 9 A.A.C. 10. The rules currently in 9 A.A.C. 20 will be replaced with amended rules for other types of behavioral health service agencies, such as facilities that provide DUI services, misdemeanor domestic violence offender treatment, or adult therapeutic foster care, which are also currently regulated under the rules in 9 A.A.C. 20. The rules regulating these types of behavioral health service agencies will be revised consistent with statutory authority: A.R.S. § 36-2006 for facilities providing DUI services; A.R.S. § 13-3601.01 for misdemeanor domestic violence offender treatment; and A.R.S. § 36-502 for adult therapeutic foster homes. The Department has posted draft rules for these types of behavioral health service agencies on the Department web site ([http://www.azdhs.gov/diro/admin\\_rules/behavioralhealth.htm](http://www.azdhs.gov/diro/admin_rules/behavioralhealth.htm)). This Notice of Public Information provides notice that the Department has posted the draft rules and is soliciting comments from interested persons.

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**4. The website where persons may obtain information about the rulemaking:**

[http://www.azdhs.gov/diro/admin\\_rules/behavioralhealth.htm](http://www.azdhs.gov/diro/admin_rules/behavioralhealth.htm)

**NOTICE OF PUBLIC INFORMATION**

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
PESTICIDES AND WATER POLLUTION CONTROL**

[M13-39]

**1. Name of the Agency:**

Arizona Department of Environmental Quality

**Title and its heading:**

18, Environmental Quality

**Chapter and its heading:**

6, Department of Environmental Quality - Pesticides and Water Pollution Control

**Article and its heading:**

3, Groundwater Protection List

**Section and its heading:**

R18-6-301, Groundwater Protection List

**2. The public information relating to the listed statute:**

Pursuant to A.R.S. § 49-305, the Arizona Department of Environmental Quality (Department) maintains a Groundwater Protection List (GWPL) composed of agricultural use pesticides and active ingredients that have the potential to pollute groundwater. The statute requires the Department to place a pesticide identified under A.R.S. § 49-303(C)(2) and (3) on the GWPL, and to regulate the use of the pesticide if the pesticide is intended for application to or injection into the soil by ground-based application equipment or chemigation, or the label of the pesticide requires or recommends that the application be followed within 72 hours by flood or furrow irrigation.

**3. Draft 2013 Groundwater Protection List**

The GWPL is a list of agricultural use pesticide active ingredients that have the potential to pollute groundwater. An agricultural use pesticide active ingredient is placed on the GWPL for any of the following reasons: 1) it fails to comply with the established specific numeric values, 2) the environmental fate assessment indicates potential to leach to groundwater or 3) an active ingredient or degradation product has been detected in groundwater consistent with established testing requirements.

Pursuant to A.A.C. R18-6-301, the Department is publishing the draft 2013 GWPL to provide an opportunity for the public to comment on the active ingredients being placed on or removed from the GWPL. The final 2012 GWPL contained 82 active ingredients; the draft 2013 GWPL would add three new active ingredients: Amicarbazone, Fluopyram and Penflufen. With this publication, a 30-day public review and written comment period begins. After completion of the 30-day review and comment period, the Department will formulate a response to any comments submitted and consider making modifications to the GWPL in response to the comments. If no comments are received, the draft GWPL becomes final. If comments are received, the revised GWPL will then be re-published in the *Arizona Administrative Register*, including a summary of comments received and the Department's response to the comments. The final 2013 GWPL will become effective on December 1, 2013, in accordance with R18-6-301(A)(3) and will be posted on the agency's web site at: <http://www.azdeq.gov/environ/water/compliance/pesticide.html#gpl>

<b>Draft 2013 Groundwater Protection List</b>		
	CAS Number	Chemical Name
1.	<b>94-75-7</b>	<b>2,4-D Acid</b>
2.	1928-43-4	2,4-D 2-Ethylhexyl Ester
3.	1929-73-3	2,4-D Butoxyethyl Ester
4.	5742-19-8	2,4-D Diethanolamine Salt
5.	2008-39-1	2,4-D Dimethylamine Salt
6.	5742-17-6	2,4-D Isopropylamine Salt
7.	94-11-1	2,4-D Isopropyl Ester of
8.	32341-80-3	2,4-D Trisopropanolamine Salt
9.	135158-54-2	Acibenzolar-S-Methyl
10.	129909-90-6	*Amicarbazone*
11.	858956-08-8	Aminocyclopyrachlor
12.	<b>1912-24-9</b>	<b>Atrazine</b>

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13.	131860-33-8	Azoxystrobin
<b>Draft 2013 Groundwater Protection List</b>		
14.	<b>314-40-9</b>	<b>Bromacil</b>
15.	53404-19-6	Bromacil, Lithium Salt
16.	<b>63-25-2</b>	<b>Carbaryl</b>
17.	128639-02-1	Carfentrazone-Ethyl
18.	50008-15-1	Chlorantraniliprole
19.	122453-73-0	Chlorfenapyr
20.	1702-17-6	Clopyralid
21.	420-04-2	Cyanamide
22.	113136-77-9	Cyclanilide
23.	52918-63-5	Deltamethrin
24.	13684-56-5	Desmedipham
25.	<b>1918-00-9</b>	<b>Dicamba</b>
26.	25059-78-3	Dicamba, DEA Salt
27.	104040-79-1	Dicamba, DGA Salt
28.	2300-66-5	Dicamba, DMA Salt
29.	10007-85-9	Dicamba, Potassium Salt
30.	1982-69-0	Dicamba, Sodium Salt
31.	<b>110488-70-5</b>	<b>Dimethomorph</b>
32.	165252-70-0	Dinotefuran
33.	<b>330-54-1</b>	<b>Diuron</b>
34.	144-21-8	DSMA (Disodium Methanearsonate)
35.	137512-74-4	Emamectin Benzoate
36.	<b>115-29-7</b>	<b>Endosulfan</b>
37.	104040-78-0	Flazasulfuron
38.	158062-67-0	Flonicamid
39.	658066-35-4	*Fluopyram*
40.	335104-84-2	Flubendiamide
41.	142459-58-3	Flufenacet (Thiafluamide)
42.	193740-76-0	Fluoxastrobin
43.	<b>66332-96-5</b>	<b>Flutolanil</b>
44.	77182-82-2	Glufosinate-Ammonium
45.	112226-61-6	Halofenozide
46.	100784-20-1	Halosulfuron-Methyl
47.	<b>114311-32-9</b>	<b>Imazamox</b>
48.	104098-48-8	Imazapic
49.	<b>81335-77-5</b>	<b>Imazethapyr</b>
<b>Draft 2013 Groundwater Protection List</b>		

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50.	101917-66-2	Imazethapyr, Ammonium Salt
51.	122548-33-8	Imazosulfuron
52.	<b>138261-41-3</b>	<b>Imidacloprid</b>
53.	950782-96-2	Indaziflam
54.	<b>330-55-2</b>	<b>Linuron</b>
55.	128-58-3	MAA (Methanearsonic Acid)
56.	374726-62-2	Mandipropamid
57.	12427-38-2	Maneb
58.	16484-77-8	Mecoprop-P (MCP-P)
59.	70630-17-0	Mefenoxam
60.	208465-21-8	Mesosulfuron-Methyl
61.	<b>16752-77-5</b>	<b>Methomyl</b>
62.	<b>161050-58-4</b>	<b>Methoxyfenozide</b>
63.	<b>21087-64-9</b>	<b>Metribuzin</b>
64.	2163-80-6	Monosodium Methanearsonate (MSMA)
65.	111991-09-04	Nicosulfuron
66.	<b>23135-22-0</b>	<b>Oxamyl</b>
67.	494793-67-8	*Penflufen*
68.	<b>1610-78-0</b>	<b>Prometon</b>
69.	<b>7287-19-6</b>	<b>Prometryn</b>
70.	18311274-15-7	Propoxycarbazone-sodium
71.	94125-34-5	Prosulfuron
72.	123312-89-0	Pymetrozine
73.	123343-16-8	Pyriithiobac Sodium
74.	84087-01-4	Quinclorac
75.	372137-35-4	Saflufenacil
76.	81591-81-3	Sulfosate
77.	107534-96-3	Tebuconazole
78.	112410-23-8	Tebufenozide
79.	153719-23-4	Thiamethoxam
80.	317815-83-1	Thiencarbazone-methyl
81.	210631-68-8	Topramezone
82.	55335-06-3	Triclopyr
83.	117718-60-2	Thiazopyr
84.	199119-58-9	Trifloxysulfuron-Sodium
85.	95266-40-3	Trinexapac-Ethyl

**Bold** text indicates ingredients that have been detected historically in Arizona groundwater.  
Asterisk (\*) indicates new additions to the GWPL.

**4. The name and address of agency personnel with whom persons may communicate:**

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Notices of Public Information

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**5. The time during which the agency will accept written comments and the time and place where oral comments may be made:**

There is no public hearing associated with establishment of the GWPL. The Department will accept written comments on the draft GWPL for 30 days following publication of this Notice. If there are any changes, the Department will publish the revised, final 2013 GWPL in the *Arizona Administrative Register* and post on the agency's web site at: <http://www.azdeq.gov/environ/water/compliance/pesticide.html#gpl>.

**NOTICE OF PUBLIC INFORMATION**

**DEPARTMENT OF ENVIRONMENTAL QUALITY**

[M13-38]

- 1. A.R.S. Title and its heading:** 49, The Environment  
**A.R.S. Chapter and its heading:** 2, Water Quality Control  
**A.R.S. Article and its heading:** 2.1, Total Maximum Daily Loads  
**Section:** A.R.S. § 49-234, Total maximum daily loads; implementation plans

**2. The public information relating to the listed statute:**

Pursuant to A.R.S. § 49-234, the Arizona Department of Environmental Quality (Department or ADEQ) is required to develop a total maximum daily load (TMDL) for navigable waters that are listed as impaired. The purpose of this notice is to publish the Department's determinations of total pollutant loadings for a TMDL for the Little Colorado River (Reach 15020002-004, Silver Creek to Carr Lake Draw) that the Department intends to submit to the Regional Administrator for Region 9, U.S. Environmental Protection Agency (EPA) for approval.

Public notice of the opportunity for public comment on the draft "Little Colorado River Silver Creek to Carr Lake Draw *Escherichia coli* TMDL" was published in *The Tribune-News* of Holbrook, Ariz., a newspaper of general circulation in the vicinity of the impaired reach, on October 31, 2012. The public comment period extended from November 9, 2012 to December 7, 2012.

**3. Total Maximum Daily Loads (TMDLs)**

**A. TMDL Process**

A TMDL represents the total load of a pollutant that can be assimilated by a waterbody on a daily basis and still meet the applicable water quality standard. The TMDL can be expressed as the total mass or quantity of a pollutant that can enter the waterbody within a unit of time. In most cases, the TMDL determines the allowable concentration or density of a pollutant in units per day and divides it among the various contributors in the watershed as wasteload (i.e., point source discharge) and load (i.e., nonpoint source) allocations. The TMDL must also account for natural background sources and provide a margin of safety.

In Arizona, as in other states, changes in standards or the establishment of site-specific standards are the result of ongoing science-based investigations or changes in toxicity criteria from EPA. Changes in designated uses and standards are part of the surface water standards triennial review process and are subject to public review. Standards are not changed simply to bring the waterbody into compliance, but are based on sound science that includes evaluation of the risk of impact to humans or aquatic and wildlife communities. Existing uses of the waterbody and natural conditions are considered when standards for specific water segments are established.

These TMDLs meet or exceed the following EPA Region 9 criteria for approval:

**Plan to meet State Surface Water Quality Standards:** The TMDLs include a study and a plan for the specific pollutants that must be addressed to ensure that applicable water quality standards are attained.

**Describe quantified water quality goals, targets, or endpoints:** The TMDL must establish numeric endpoints for the water quality standards, including beneficial uses to be protected, as a result of implementing the TMDLs. This often requires an interpretation that clearly describes the linkage(s) between factors impacting water quality standards.

**Analyze/account for all sources of pollutants:** All significant pollutant sources are described, including the location and the magnitude of sources where data is available.

**Identify pollution reduction goals:** The TMDL plan includes pollutant reduction targets for all point and nonpoint sources of pollution.

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**Describe the linkage between water quality endpoints and pollutants of concern:** The TMDLs must explain the relationship between the numeric targets and the pollutants of concern and determine whether the recommended pollutant load allocations exceed the loading capacity of the receiving water.

**Develop margin of safety that considers uncertainties, seasonal variations, and critical conditions:** The TMDLs must describe how any uncertainties regarding the ability of the plan to meet water quality standards have been addressed. The plan must consider these issues in its recommended pollution reduction targets.

**Provide implementation recommendations for pollutant reduction actions and a monitoring plan:** The TMDLs should provide a specific process and schedule for achieving pollutant reduction targets. A monitoring plan should also be included, especially where management actions will be phased in over time and to assess the validity of the pollutant reduction goals.

**Include an appropriate level of public involvement in the TMDL process:** This is usually met by publishing public notice of the TMDLs in a newspaper of general circulation in the area affected by the study, circulating the TMDLs for public comment, and holding public meetings in local communities. Public involvement must be documented in the state's TMDL submittal to EPA Region 9.

**In addition, these TMDLs specifically comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 2.1 through this public notice:** Publication of these TMDLs in the Arizona Administrative Review (A.A.R.) is required per Arizona Revised Statute, Title 49, Chapter 2, Article 2.1 prior to submission of the TMDL to EPA. The Department shall:

1. Prepare a draft estimate of the total amount of each pollutant that causes impairment from all sources that may be added to a navigable water while still allowing the navigable water to achieve and maintain applicable surface water quality standards;
2. Determine draft allocations among the contributing sources that are sufficient to achieve the total loadings;
3. Provide public notice and allow for comment on each draft estimate and draft allocation and shall prepare written responses to comments received on the draft estimates and draft allocations;
4. Publish the determinations of total pollutant loadings that will not result in impairment and the draft allocations among the contributing sources that are sufficient to achieve the total loadings that it intends to submit initially to the regional administrator, along with a summary of the responses to comments on the estimated loadings and allocations, in the A.A.R. at least forty-five days before the submission of the loadings and allocations to the regional administrator.

Federal law only requires the submittal of the pollutant loadings to EPA for approval. However, the Department considers the pollutant loadings and the draft allocations to be integrally related and that they should be presented together to afford the public a complete understanding of the issues, outcomes and recommendations of the TMDL analysis. For that reason, the Department has combined the loadings and allocations in this publication in the A.A.R.

**B. TMDL for the Little Colorado River Reach 15020002-004**

The Arizona Department of Environmental Quality (ADEQ) 2004 Clean Water Act (CWA) 303[d] List classified the Little Colorado River (LCR) (Reach #15020002-004: from Silver Creek to Carr Lake Draw) as impaired for the Full Body Contact (FBC) designated uses due to *Escherichia coli* (*E. coli*) exceedances (two exceedances in nine assessed events). The 2006/2008 Assessment classified the reach as remaining impaired for *E. coli* with one of seven events exceeding the single sample maximum (SSM) in the previous three years and three exceedances in the five-year assessment window. Impairment listings result in a total maximum daily load (TMDL) study and report detailing how the impaired waterbody may be brought into attainment of state water quality standards through identification of non-point source areas, critical conditions, and percent reductions necessary.

Sampling commenced in 2007 for this TMDL project. Sampling sites were located to take advantage of the presence of a USGS gauge on the LCR in the community of Woodruff and to isolate contributions from the two major subwatersheds feeding the LCR main-stem in the Woodruff vicinity. Seasonality was addressed through sampling at baseflow, spring runoff and storms. All sampling was done via grab sampling methods. TMDL sampling included a minimum of two baseflow, four storm, and one spring melt events. Water samples were analyzed for *E. coli* using the Colilert-18 method. Samples were processed within six hours of collection and read within 18-22 hours after processing. Where necessary, dilution of samples taken in turbid or stormflow conditions was used to quantify bacterial concentrations. Dilutions at 1:10 and 1:100 were typically used with the Colilert-18 method. Historic data employed in the TMDL analysis generally employed the mTEC plate count method.

Load duration curves were used for modeling *E. coli* loads and calculating the TMDL target values for Reach 15020002-004. The load duration curve approach was chosen for its flexibility, its capacity to identify and address flow-dependent conditions, and the ability to classify and analyze various data points individually in accordance with the requirements of Arizona's water quality standard for *E. coli*. Long-term USGS streamflow gauges in the watershed permitted an in-depth examination of flow history.

Data collected throughout the TMDL project cycle in all hydrologic flow regimes confirms that the great majority of loads exceeding the stream's assimilation capacity occur when the LCR is adding loads to the near-perennial Silver Creek. In mid-range, dry and low-flow conditions, when flow persists in the impaired reach due to the flow of Silver Creek alone, exceedances rarely occur. Storm conditions causing the LCR to flow contribute a sizable increase in



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both the percentage of exceedances and the density counts of *E. coli* samples in those exceedances. Silver Creek contributes to those exceedances, but LCR inputs add an order or magnitude or more to the loads measured at the Woodruff site in the upper two flow classes. Flow of the LCR above the Silver Creek confluence due to precipitation events constitutes a major critical condition identified for subsequent analysis.

In nonstorm flow conditions, when overland flow is not occurring and the intermittent reaches of the LCR are not contributing inputs, Silver Creek is already meeting TMDL targets. No existing category load exceeded its TMDL load allocation in the two upper flow classes in which data is presented. Though results must be considered provisional due to limited numbers of samples within each class to make definitive assertions, the high flow and moist conditions categories both met their targets under nonstorm flow conditions. Analysis was not extended into flow classes where Woodruff data shows the impaired reach is already meeting TMDL targets.

The picture changes when consideration turns to stormflows and the addition of LCR inputs. The cumulative reduction percentages outlined show that very high levels of existing loads have historically shown up at the Woodruff site for flows exceeding the 40<sup>th</sup> percentile flow value. While detailed source identification was not performed on data between 1993 and 2007, examination of the limited datasets for identified stormflows of both Silver Creek and the LCR show that both are contributing to class load exceedances when overland flow is occurring. For the LCR at Woodruff, load reductions of 98.9 percent (existing load 128,169 G-org/day, TMDL-MOS target value 1189 G-org/day) and 97.8 percent (existing load 5006 G-org/day, TMDL-MOS target value 96 G-org/day) for the 90<sup>th</sup> percentile values are required for the upper two flow classes respectively to attain their target values. These load reductions translate into a two-order of magnitude reduction and 1.72 order of magnitude reduction respectively. The mid-range, dry conditions, and low flow classes for flows below 9.0 cfs are meeting TMDL targets. When considering the data from each subwatershed individually in stormflow conditions, the LCR above Silver Creek shows a need for a 98.8 percent reduction in the high flow category and a 99.8 percent reduction in the moist conditions category, while Silver Creek shows a need for reductions of 98 percent in the high flow category and more moderate reductions of 55.8 percent in the moist conditions flow class based upon a limited dataset.

In summary, loads are exceeding the system's assimilation capacity when stormflow dominates the hydrologic flow regime and overland flow is occurring. Loading is greatly exacerbated by contributions from the LCR subwatershed above the Silver Creek confluence during stormflow events. Load duration analysis suggests that point sources are not an issue for the impairment, as the low flow categories show no problems. Rather, a mix of bank contributions, upland overland flows, storm water from impervious developed areas, and riparian zone/floodplain contributions are the likely stressors in descending order of significance.

TMDL CALCULATIONS

The TMDL calculations are based on flow and concentration data analyzed using load duration curves.

The TMDL or loading capacity and the resulting load reductions necessary to meet the TMDL is determined using the TMDL equation:

$$TMDL = \sum WLA + \sum LA + MOS$$

Where WLA is waste load allocation (point sources), LA is load allocation (nonpoint sources and natural background), and MOS is a margin of safety. Loading capacity, existing loads, and reductions needed for water quality standard attainment are calculated for major tributaries to Reach 004 and their associated subwatersheds.

MARGIN OF SAFETY

A baseline margin of safety of 10 percent is subtracted from the TMDL allowance for each flow class to buffer against uncertainties in analysis, including variability of coliform densities, variability and error associated with flow measurement, variability in the Colilert incubation and enumeration process, and other uncertainties associated with sampling and enumeration. An additional two percent margin of safety is applied to account for contributions from the LCR Silver-Carr Lake Draw subwatershed that cannot be isolated from the cumulative *E. coli* densities determined at the Woodruff site. The subwatershed is being accounted for in an areal comparison relative to the size of the entire contributing watershed; its area comprises 0.56 percent of total watershed area. The additional two percent allowance permits this subwatershed's contributions to be assimilated in the TMDL value without explicit numeric values and adds an additional implicit margin of safety beyond the subwatershed's expected contribution.

WASTE LOAD ALLOCATIONS

AZPDES/NPDES Permits

Three AZPDES-permitted facilities exist in the LCR basin upstream of the Carr Lake Draw confluence, with Pinetop-Lakeside's permit to discharge to waters of the U.S. expiring without renewal on January 22, 2012. Terms of Permit AZ 0026034 for the Town of Snowflake WWTP shall mandate that discharges meet surface water quality standards for the Full Body Contact (FBC) designated use of a 30 day geometric mean of 126 and a single sample maximum of 235 cfu/100 ml. The terms of the permit fact sheet acknowledge that discharge may reach or affect Silver Creek, and thus the permit was written to protect Silver Creek uses. Snowflake WWTP's permit to discharge expired in October of 2009, and Snowflake applied for renewal in December 2010 upon learning this TMDL was being drafted. Based upon Snowflake WWTP's maximum daily discharge of 0.6 mgd (equivalent to 0.928 cfs), the Snowflake WWTP will be assigned a numeric waste load allocation of 5.33 G-org/day in the TMDL calculation where flow categories permit, as outlined below.

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The Show Low Municipal WWTP (AZ0023841) discharges to constructed wetlands in former playa wetlands (Pintail Lake and Telephone Lake), with provisions made for excess discharges to be diverted or allowed by overland flow to an additional wetland (Ned Lake). These lakes/wetlands exist in small hydrologically closed basins. The discharges are not expected to enter the hydrologic network and impact the water quality of Silver Creek or the LCR. This is reflected in the designated uses applied to the receiving waters (Aquatic and Wildlife Effluent Dependent Water [A&Wedw], Partial Body Contact [PBC]) with a higher permitted *E. coli* density count for single samples of 576 cfu/100ml. A mass-based numeric waste load allocation will not be applied to Show Low in the TMDL calculation. Instead, a concentration-based waste load allocation of 576 cfu/100 ml, equivalent to the terms of the permit, is hereby established for the Show Low Municipal WWTP.

The Pinetop-Lakeside Sanitary District WWTP (AZ0025437) discharges to a series of constructed pond wetlands adjacent to an ephemeral tributary of Show Low Creek. Two additional wetlands (Instream Wetland A and Instream Wetland B) were planned at the previous permit renewal to be constructed within the channel of the ephemeral drainage to handle overflow conditions during storm events and to provide additional capacity during the months of April-October. The additional wetlands were designed to allow assimilation of the entire 2.0 million gallon per day capacity of the WWTP if necessary. However, the Pinetop-Lakeside Sanitary District WWTP never constructed the planned overflow wetlands. They allowed their permit to discharge to the waters of the U.S. to formally expire on January 22, 2012. Consequently, no wasteload allocation for AZPDES Permit AZ0025437 is granted or assigned.

Flows in the LCR at Woodruff are generally low and pose a problem in a load duration analysis incorporating numeric mass-limit based waste load allocations in the low flow (Category 5) classification. The median flow of the low flow category at Woodruff is 0.4 cfs. With a design capacity of 0.6 MGD for the Snowflake WWTP (equivalent to a steady state flow of 0.93 cfs), a potential exists with a numeric mass limit-based WLA for a discharge impacting the impaired reach to exceed the calculated WLA in the lowest flow class at Woodruff if the Snowflake WWTP is discharging at plant capacity. Consequently, a numeric mass limit WLA will only be applied to the upper four flow classes. A concentration-based WLA equivalent to the single sample maximum water quality standard (235 cfu/100 ml) for Snowflake will be applied to the low flow class. Since the load duration curve is predicated on the product of discharge and concentration, it can safely be surmised that in these flow categories, if the *E. coli* water quality standard is being met at the Snowflake WWTP outfall, waste loads for the LCR at Woodruff should be in accordance with the TMDL.

There are no other individual AZPDES permits discharges where *E. coli* is a constituent of concern in Navajo or Apache counties above the LCR – Carr Lake Draw confluence. There are no NPDES facilities necessitating a WLA within the LCR watershed boundary in the State of New Mexico.

#### *MSGP and CGP General Permits*

The purpose of Arizona's multi-sector general permit (MSGP) and construction general permit (CGP) is to protect the quality and beneficial uses of Arizona's surface water resources from pollution in stormwater runoff resulting from industrial or construction activities. Under the Clean Water Act and Arizona Revised Statutes, it is illegal to have a point source discharge of pollutants to a water of the United States that is not authorized by a permit. To protect water quality, the MSGP and CGP require operators to plan and implement appropriate pollution prevention and control practices for stormwater runoff during the construction period. There will be no itemized mass-based waste load allocation expressed in terms of organisms per day set aside for MSGP or CGP activities in the LCR watershed that is the subject of this TMDL, for reasons varying with each permit. Concentration-based WLAs are discussed below.

As of fall 2012, 40 permittees were covered under the CGP in the Little Colorado River watershed in Navajo and Apache Counties. The CGP expires for all permittees on February 28, 2013, but it will be renewed for another term at that date. CGP permittees typically operate for short durations of time under permit coverage, and the number of permittees can fluctuate widely over any given period of time. Consequently, CGP permittees are not itemized in this TMDL. As of fall 2012, MSGP permittees in the LCR basin in Navajo and Apache counties numbered 17. MSGP activities and facilities are typically ongoing and of longer durations than CGP operations. These permittees are itemized in the TMDL.

For flows originating from CGP sites with direct discharge(s) to a stream reach carrying an FBC designated use, a concentration-based single sample maximum waste load allocation of 235 cfu/100 ml is established consistent with the provisions governing the remainder of this TMDL. For flows from CGP sites with direct discharge(s) to a stream reach carrying a PBC designated use, a concentration-based single sample maximum waste load allocation of 576 cfu/100 ml is established unless reasonable potential for flows to reach perennial waters is assessed by the ADEQ Stormwater Unit in the SWPPP review and approval process. In such a case, the concentration-based WLA shall be 235 cfu/100 ml.

For direct discharges resulting from storm events into stream reaches carrying an FBC designated use, the FBC *E. coli* single sample maximum standard of 235 cfu/100 ml is applied as a concentration-based wasteload allocation for each of the individual stormwater outfalls identified in the permittee's approved SWPPP. For direct discharges resulting from storm events into stream reaches carrying a PBC designated use, the PBC *E. coli* single sample maximum standard of 576 cfu/100 ml is applied as a concentration-based wasteload allocation for each of the individual stormwater outfalls identified in the permittee's approved SWPPP unless reasonable potential for flows to reach perennial waters is assessed by the ADEQ Stormwater Unit in the SWPPP review and approval process. In such a case, the concentration-based WLA shall be 235 cfu/100 ml. ADEQ does not expect that stormwater run-off from MSGP sites will

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persist long enough to determine attainment of the geometric mean portion of the *E. coli* standard, which requires a four-sample minimum collected within 30 days, with independence of samples in the set requiring no more than one sample per seven-day interval.

*Municipal Separate Storm Sewer System (MS4) Permit*

The Arizona Department of Transportation (ADOT) has state-wide Municipal Separate Storm Sewer System (MS4) permit coverage as a Medium-to-Large municipal operation for its facilities and infrastructure. ADOT operates its stormwater program under a separate individual permit (AZS000018-2008) and program known as the Statewide Stormwater Management Plan (SSWMP). Arizona has several state highways that transit the TMDL watershed, including Highways 77, 277, 260, 180, and 61.

For flows originating from existing or future sites having reasonable potential to be a source of *E. coli* and operating under MS4 coverage, a concentration-based waste load allocation of 235 cfu/100 ml (single sample maximum) is established for direct discharge(s) to a stream reach carrying an FBC designated use consistent with the provisions governing the remainder of this TMDL, where *E. coli* is reasonably assessed as being a constituent of concern. Where direct discharge(s) are to a stream reach carrying a PBC designated use, the concentration-based WLA shall be 575 cfu/100 ml unless reasonable potential for bacteriological water quality degradation of downstream FBC reaches from such discharges is assessed by the ADEQ Stormwater Unit in the SWPPP or SWMP review and approval process. In such a case, the concentration-based WLA shall be 235 cfu/100 ml. The concentration-based WLA is applicable for each separate discharge that may issue from a site location.

The point of compliance for WLAs for all discharges from MS4, MSGP, CGP, or individual AZPDES permit operations shall be the point of discharge to a reach carrying either a PBC or FBC designated use.

**LOAD ALLOCATIONS**

Nonpoint source contributions from the watershed may come from either natural background conditions or anthropogenic sources. LAs are calculated by subwatersheds and flow duration categories. Natural background quantification is also accounted for as a separate proration where explicitly allocated.

**LOAD REDUCTIONS**

Load Reductions (LR) are needed when the existing load is larger than the LA calculated using the TMDL equation. The LR can be calculated by:

$$LR = \text{Existing load} - (\text{LA} + \text{Natural background} + \text{MOS})$$

The percent reduction needed is calculated by using:

$$\% \text{ Reduction} = (\text{LR}/\text{Existing Load}) * 100$$

In cases where the LR is negative, no reduction is necessary. These categories are identified as meeting the category allocation. In instances where the inclusion of the margin MOS causes existing loads to exceed the loading capacity, a reduction in the existing load will still be required.

TMDLs identify the amount of pollutant that can be assimilated by the waterbody and still meet water quality standards. The pollutant of concern requiring TMDLs for the Little Colorado Reach 004 is *Escherichia coli* (*E. coli*). In order to calculate the load in giga (billion)-organisms per day (G-orgs/day) from discharge in cubic feet per second (cfs) and densities in colony-forming units per 100 milliliters (cfu/100 ml), a conversion factor is required:

$$\text{ft}^3/\text{sec} * 28.32\text{L}/\text{ft}^3 * 86,400\text{sec}/\text{day} * \text{org}/100 \text{ ml} * 1000\text{ml}/1\text{L} * 1\text{G-org}/1\text{E}09 \text{ org} = 0.02446 \text{ G-org}/\text{day}$$

The conversion factor of 0.02446 was used in the following equation:

$$\text{Existing Load} = Q * [\text{E. coli density (cfu/100 ml)}] * 0.02446$$

**TABLES**

The following tables detail the TMDL targets and reductions necessary for Reach 15020002-004. Table 1 addresses TMDL targets, wasteload allocations, and cumulative load allocations for each of the five flow classes. All components are summarized for both critical and non-critical tier classes. Urban load allocations are also itemized and called out as a fraction of the total load allocation.

Table 2 gives a detailed breakdown of existing 90<sup>th</sup> percentile loads and percentage reductions calculations for the critical condition tier. Table 3 gives the same breakdown of existing 90<sup>th</sup> percentile loads and percentage reductions calculations for the non-critical condition tier.

Flows and associated loads and targets are broken out into five categories for each analysis, including high flows (0-10% flows), moist conditions (10-40% flows), mid-range flows (40-60%), dry conditions (60-90%) and low flows (>90% flows).

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**Table 1. Reach 15020002-004 TMDL Targets, Wasteload Allocations, and Load Allocations**

**Reach 15020002-004: Little Colorado River, Silver Creek - Carr Lake Draw**  
**TMDL calculations, Single Sample Maximums, G-org/day**

	<i>Category 1 High Flows</i>	<i>Category 2 Moist Conditions</i>	<i>Category 3 Mid-Range Flows</i>	<i>Category 4 Dry Conditions</i>	<i>Category 5 Low Flows</i>
<b>90th percentile values</b>					
Cumulative	Reach 15020002-004 Single Sample Maximum				
	<b>1,351</b>	<b>109</b>	<b>36.8</b>	<b>16.1</b>	<b>2.30 \$</b>
	Margin of Safety (12%)	162	13.1	4.4	0.28
	TMDL - MOS (G-org/day)	1,189	96	32.4	14.2
<b>Tier 1 - Critical Conditions Little Colorado and Silver Creek Hydrologic Inputs</b>					
	Natural Background*	63	5.1	1.7	0.8
	Waste Load Allocation	5.3	5.3	5.3	5.3
	<b>Total Load Allocation</b>	<b>1120</b>	<b>85.5</b>	<b>25.3</b>	<b>8.1</b>
	Silver Creek	528	40.3	11.9	3.8
	Urban areas in Silver Creek watershed^	55	4.2	1.3	0.40
	Little Colorado River Above Silver Creek	593	45.2	13.4	4.3
	Urban area in LCR subwatershed^	2.5	0.19	0.06	0.02
#	<b>Sum</b>	<b>1,189</b>	<b>96</b>	<b>32.4</b>	<b>14.2</b>
<b>Tier 2 - Non-critical Conditions Silver Creek Only Hydrologic Input</b>					
	Natural Background*	63	5.1	1.7	0.8
	Waste Load Allocation	5.3	5.3	5.3	5.3
	Silver Creek	1,120	85.5	25.3	8.1
	Urban areas in Silver Creek watershed^	118	9.0	2.7	0.9
#	<b>Sum</b>	<b>1,189</b>	<b>96</b>	<b>32.4</b>	<b>14.2</b>

\* Natural backgrounds are percentage extrapolations from TMDL values. NB percentage 0.0532 of SSM standard.  
 \$ - Low flow category uses 92.5 percentile flow to determine target values; Flow class extends only to the 95th percentile before discharge is 0.  
 \*\* - Concentration based WLA for Snowflake WWTP in Class 5.  
 # - Due to rounding, elements of summation may not equal summed value.  
 ^ - Values for these line items are not a part of TMDL summations. Values are presented as portions of subwatershed load allocations.

**Table 2. Load Reduction Calculations, Tier 1 - Critical Conditions, Reach 15020002-004**

**Reach 15020002-004: Little Colorado, Silver Creek to Carr Lake Draw**  
**Single Sample Maximums, G-org/day**

<b>TMDL Cumulative Reductions</b>	<i>Category 1 High Flows</i>	<i>Category 2 Moist Conditions</i>	<i>Category 3 Mid-Range Flows</i>	<i>Category 4 Dry Conditions</i>	<i>Category 5 Low Flows</i>
<b>TMDL 90th Percentile E. coli Target Values</b>					
Reach 15020002-004 Target TMDL	1351	109	36.8	16.1	2.3\$
Margin of Safety	12%	12%	12%	12%	12%
Reach 15020002-004 Existing	<b>128,169</b>	<b>5,006</b>	<b>5.21</b>	<b>6.12</b>	<b>1.32</b>
Reach 15020002-004 TMDL-MOS	1,189	96	32.4	14.2	2.02
Load Allocations	<b>1,120</b>	<b>85.5</b>	<b>25.3</b>	<b>8.1</b>	<b>1.92</b>
Waste Load Allocation	5.3	5.3	5.3	5.3	**
Natural Background*	63	5.1	1.7	0.8	0.11
Load Allocation Reductions Needed	<b>99.1%</b>	<b>98.3%</b>	<b>Meets</b>	<b>Meets</b>	<b>Meets</b>
<b>### Cumulative Reductions Needed</b>	<b>98.9%</b>	<b>97.8%</b>	<b>Meets</b>	<b>Meets</b>	<b>Meets</b>
<b>TMDL Reduction Calculations, 90th percentile G-org/day</b>					
<b>Tier 1: Critical Conditions Analysis</b>					
LCR, Silver Creek to Lyman Lake Dam Existing	47,672	23,405	--	--	--
LCR, Silver Creek to Lyman Lake Dam LA	593	45	--	--	--
Waste Load Allocation	0	0	--	--	--
<b>Reductions Needed</b>	<b>98.8%</b>	<b>99.8%</b>	--	--	--
Silver Creek above LCR confluence Existing	26,510	91	--	--	--
Silver Creek above LCR confluence LA	528	40	--	--	--
Waste Load Allocation	5.3	5.3	--	--	--
<b>Reductions Needed</b>	<b>98.0%</b>	<b>55.8%</b>	--	--	--
LCR, Silver Creek - Carr Lake Draw Existing	Implicit#	Implicit#	--	--	--
LCR, Silver Creek - Carr Lake Draw LA	0	0	--	--	--
Waste Load Allocation	0	0	--	--	--
Reductions Needed	--	--	--	--	--

# - LCR-SC-CLD subwatershed comprises only 0.56% of total watershed area. Additional 2% added to MOS to account for this subwatershed.  
 ## Reductions for entire watershed are cumulative reductions; reductions for subwatershed cannot be abstracted from flow and load data.  
 \* Natural backgrounds are percentage extrapolations from TMDL values. NB percentage 0.0532 of SSM standard.  
 \$ - Low flow category uses 92.5 percentile flow to determine target values; Flow class extends only to the 95th percentile before discharge is 0.  
 \*\* - Concentration based WLA for WWTP in Class 5. Provisional reduction - fewer than four data points

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**Table 3. Load Reduction Calculations, Tier 2 - Non-Critical Conditions, Reach 15020002-004**

**Reach 15020002-004: Little Colorado, Silver Creek to Carr Lake Draw  
TMDL Reduction Calculations, 90th percentile  
Single Sample Maximums, Gorg/day**

<b>Tier 2: Non-Critical Conditions Analysis</b>	<i>Category 1 High Flows</i>	<i>Category 2 Moist Conditions</i>	<i>Category 3 Mid-Range Flows</i>	<i>Category 4 Dry Conditions</i>	<i>Category 5 Low Flows</i>
Reach 15020002-004 TMDL-MCS	<b>1,189</b>	<b>96</b>	<b>324</b>	<b>142</b>	<b>202</b>
Silver Creek above LCR confluence Existing	10.4	57.5	--	--	--
Silver Creek above LCR confluence LA	1,120	85.5	--	--	--
Waste Load Allocation	53	53	--	--	--
Reductions Needed	*	*	--	--	--
LCR, Silver Creek - Carr Lake Draw Existing	See cumulative values above		--	--	--
LCR, Silver Creek - Carr Lake Draw LA	Implicit#	Implicit#	--	--	--
Waste Load Allocation	0	0	--	--	--
Reductions Needed	See cumulative values above		--	--	--

\* - Inconclusive. Insufficient data to determine 90th percentile value ;

Provisionally meets TMDL - Snowmelt events with *E. coli* concentrations not approaching SSM

# - LCR SC-CLD subwatershed comprises only 0.56% of total watershed area. Additional 2% added to MCS to account for this subwatershed.

**SUMMARY OF COMMENTS**

Comments were received from Region 9 of the USEPA. Below is a summary of the comments and ADEQ's responses.

**EPA comments**

**Comments specific to both the SSC and E. coli TMDLs**

***Background Information (TMDL Watershed Boundary)***

1.) *It is unclear which portion of the Little Colorado Basin the TMDLs WLAs and LAs apply to. Please state which subwatersheds these TMDLs are established for. Please also include a map with the watershed boundaries of the TMDLs in the Source Assessment Section. This watershed boundary map should display the city boundaries for any developed areas (Snowflake, Taylor, Shumway) surrounding the major and minor tributaries, and Little Colorado River impaired reach. The reaches of major and minor tributaries as well as the impaired reach should be clearly labeled.*

*Any other developed urban areas described in the TMDLs, should also be included on the above map (Pinetop-Lakeside, Show Low, St. Johns, etc.) or on a separate larger watershed map for spatial clarification.*

A paragraph discussing WLAs and their geographic application was added to both TMDLs (Section 7.3 – SSC; Section 8.3 – *E. coli*) as requested. ADEQ has also added watershed maps with all requested information to Sections 4.0 (SSC TMDL) and 5.0 (*E. coli* TMDL) of the TMDL documents.

***Source Assessment***

2.) *In Section 4.1.1 AZPDES and NPDES Permits, It would be helpful to include a map of the outfall location(s) for the Snowflake WWTP and the Show Low WWTP, with similar contextual information as the watershed boundary map described in the Section 2 Background Information (TMDL Watershed Boundary) comments above.*

A map with contextual information showing outfall locations at both large and small scales for discharging permittees granted a WLA was added to the SSC TMDL (Section 4.1.1) and the *E. coli* TMDL (Section 5.1.1).

3.) *In Section 4.1.2 General Permits, Current and Future Permittees, it is unclear how many permittees are covered under the Non-Mining MSGP, Mining MSGP, and CGP permits, and where in the TMDL watershed they are located. Please provide the number of active permittees currently covered under each permit in this section. In addition, please provide in Section 7 TMDL Calculations (or as an Appendix to the TMDL), a list of entities covered under the above listed permits.*

ADEQ has considered EPA's request and added tables to both TMDLs (Section 5.1.5 – *E. coli* TMDL; Section 4.1.2 - SSC TMDL) detailing all updated MSGP (Mining; Non-mining; Mining & Non-mining) permittees in the TMDL watershed as of the fall of 2012, as these permittees tend to be associated with facilities and operations of long-standing duration. CGP permittees have not been itemized in the same fashion due to the rapid turnover in permittees covered under the general permit, the transient and localized nature of these permit operations, and the recognition that

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any itemization published in the TMDL would be outdated before final approval of the documents. The number of permittees under CGP coverage in the TMDL watershed declined from over 70 to less than 40 while the TMDL was being finalized in just the last year. ADEQ has included updated numbers as of the fall of 2012 of permittees covered under both types of general permits in the named sections.

**TMDL Calculations**

4.) *The TMDL states that (for the Show Low WWTP): “..it is unlikely that the discharges would enter the hydrological network and impact the water quality of Silver Creek or the LCR...(pg. 33, SSC TMDL). However, the TMDLs for SSC and E. coli establish a SSC WLA for the Show Low WWTP at 25 mg/L as a concentration load, and an E. coli WLA at 576cfu/100mL. The TMDLs should make a determination on whether or not discharges from the Show Low WWTP have the potential to contribute E. coli and SSC loads to Silver Creek and the Little Colorado River. If there is potential to contribute E. coli and SSC loads, then the concentration based WLA appears appropriate. However, the implementation procedures may wish to consider how the WLA can account for the existing treatment provided in the wetlands after the outfall discharge point. If no potential exists, then applying a concentration based WLA would place an unnecessary compliance limit on the WWTP.*

ADEQ has standardized the language between the two TMDLs to make it clearer that ADEQ’s determination is that Show Low WWTP discharges are not expected to add loading to the LCR hydrologic network. However, ADEQ has included a WLA for both SSC and *E. coli* for this facility to be consistent with the permit that has been granted authorizing discharges to a water of the United States. The WLA was established consistent with permit terms and/or water quality standards, and any discharges that meet permit terms (or water quality standards, where permit terms do not address the constituent of concern), will be consistent with the provisions governing the implementation of the TMDL even if the discharges enter the hydrologic network in extreme events.

5.) *For the WLAs established for the MSGP, CGP, and WWTPs, please state where (e.g., location) the dischargers are expected to meet the WLAs (i.e., point of compliance).*

Language has been added addressing the points of compliance for each TMDL in Section 7.3 (SSC TMDL) and Section 8.3 (*E. coli* TMDL).

6.) *Table 8 Sample Population (SSC TMDL) and Table 6 (E. coli TMDL) includes the number of samples analyzed from 3 monitoring stations. Please include tables (or add to these tables) that describe the locations, E. coli and SSC exceedance data, and dates for each of these three monitoring location (and any other relative samples) used in the TMDLs to assess the magnitude and sources of impairment.*

Tables have been added to both TMDLs detailing the specific sampling sites, dates, flows, concentrations, loads and categories of flow for exceedance events considered in the TMDL analysis. The tables may be found in Section 8.5 (*E. coli* TMDL) and Section 7.5 (SSC TMDL).

7.) *The SSC TMDL establishes a LA for the entire Watershed, and the E. coli TMDL establishes a LA for each of the 3 Subwatersheds. In the SSC TMDL the urban areas are pinpointed as contributing to nonpoint source sediment loads (“the Shumway-Taylor- Snowflake corridor”). In the E. coli TMDL, it is suggested that stormwater runoff from impervious developed areas contributes to the bacteria exceedances. We suggest that these urban areas be assigned a portion of the LA relative to their contribution of the non-point source load.*

ADEQ has added separate line items in the TMDL breakdown tables (Table 12 – SSC; Table 10 – *E. coli*) for urban contributions to both *E. coli* and SSC loading of the Little Colorado River. These line items, though present in a summation table, are not values considered in the summations, but rather a portion of the total load allocation from the pertinent subwatershed. Urban fractions of the total load allocation were developed and incorporated on a percent area basis for the incorporated town areas relative to either the subwatershed area (for the *E. coli* analysis) or to the total watershed area (for the SSC analysis). A table was included in the *E. coli* document detailing the subwatershed figures used to establish the percentages. It is noted in the narrative and cautioned here that TMDL sampling did not attempt to isolate urban loading apart from total loading; no conclusions can be drawn from the TMDL regarding reductions that may or may not be necessary for urban runoff.

**4. Name and address of agency personnel with whom persons may communicate:**

Name: Doug McCarty, Project Hydrologist, TMDL Unit  
Address: Arizona Department of Environmental Quality  
1110 W. Washington Street  
Phoenix, AZ 85007  
Telephone: (602) 771-4521  
Fax: (602) 771-4528  
E-mail: [Mccarty.Doug@azdeq.gov](mailto:Mccarty.Doug@azdeq.gov)

Copies of the final TMDL may be obtained from the Department by contacting the numbers above. The final TMDL may also be downloaded from the Department’s web site at: <http://www.azdeq.gov/environ/water/assessment/status.html>.

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DEPARTMENT OF ENVIRONMENTAL QUALITY

[M13-37]

1. **A.R.S. Title and its heading:** 49, The Environment  
**A.R.S. Chapter and its heading:** 2, Water Quality Control  
**A.R.S. Article and its heading:** 2.1, Total Maximum Daily Loads  
**Section:** A.R.S. § 49-234, Total maximum daily loads; implementation plans

2. **The public information relating to the listed statute:**

Pursuant to A.R.S. § 49-234, the Arizona Department of Environmental Quality (Department or ADEQ) is required to develop a total maximum daily load (TMDL) for navigable waters that are listed as impaired. The purpose of this notice is to publish the Department's determinations of total pollutant loadings for a TMDL for the Little Colorado River (Reach 15020002-004, Silver Creek to Carr Lake Draw) that the Department intends to submit to the Regional Administrator for Region 9, U.S. Environmental Protection Agency (EPA) for approval.

Public notice of the opportunity for public comment on the draft "Little Colorado River Silver Creek to Carr Lake Draw Suspended Sediment Concentration TMDL" was published in *The Tribune-News* of Holbrook, Ariz., a newspaper of general circulation in the vicinity of the impaired reach, on October 31, 2012. The public comment period extended from November 9, 2012 to December 7, 2012.

3. **Total Maximum Daily Loads (TMDLs)**

A. **TMDL Process**

A TMDL represents the total load of a pollutant that can be assimilated by a waterbody on a daily basis and still meet the applicable water quality standard. The TMDL can be expressed as the total mass or quantity of a pollutant that can enter the waterbody within a unit of time. In most cases, the TMDL determines the allowable concentration or density of a pollutant in units per day and divides it among the various contributors in the watershed as wasteload (i.e., point source discharge) and load (i.e., nonpoint source) allocations. The TMDL must also account for natural background sources and provide a margin of safety.

In Arizona, as in other states, changes in standards or the establishment of site-specific standards are the result of ongoing science-based investigations or changes in toxicity criteria from EPA. Changes in designated uses and standards are part of the surface water standards triennial review process and are subject to public review. Standards are not changed simply to bring the waterbody into compliance, but are based on sound science that includes evaluation of the risk of impact to humans or aquatic and wildlife communities. Existing uses of the waterbody and natural conditions are considered when standards for specific water segments are established.

These TMDLs meet or exceed the following EPA Region 9 criteria for approval:

**Plan to meet State Surface Water Quality Standards:** The TMDLs include a study and a plan for the specific pollutants that must be addressed to ensure that applicable water quality standards are attained.

**Describe quantified water quality goals, targets, or endpoints:** The TMDL must establish numeric endpoints for the water quality standards, including beneficial uses to be protected, as a result of implementing the TMDLs. This often requires an interpretation that clearly describes the linkage(s) between factors impacting water quality standards.

**Analyze/account for all sources of pollutants:** All significant pollutant sources are described, including the location and the magnitude of sources where data is available.

**Identify pollution reduction goals:** The TMDL plan includes pollutant reduction targets for all point and nonpoint sources of pollution.

**Describe the linkage between water quality endpoints and pollutants of concern:** The TMDLs must explain the relationship between the numeric targets and the pollutants of concern and determine whether the recommended pollutant load allocations exceed the loading capacity of the receiving water.

**Develop margin of safety that considers uncertainties, seasonal variations, and critical conditions:** The TMDLs must describe how any uncertainties regarding the ability of the plan to meet water quality standards have been addressed. The plan must consider these issues in its recommended pollution reduction targets.

**Provide implementation recommendations for pollutant reduction actions and a monitoring plan:** The TMDLs should provide a specific process and schedule for achieving pollutant reduction targets. A monitoring plan should also be included, especially where management actions will be phased in over time and to assess the validity of the pollutant reduction goals.

**Include an appropriate level of public involvement in the TMDL process:** This is usually met by publishing public notice of the TMDLs in a newspaper of general circulation in the area affected by the study, circulating the TMDLs for public comment, and holding public meetings in local communities. Public involvement must be documented in the state's TMDL submittal to EPA Region 9.

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**In addition, these TMDLs comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 2.1:** Publication of these TMDLs in the Arizona Administrative Review (A.A.R.) is required per Arizona Revised Statute, Title 49, Chapter 2, Article 2.1 prior to submission of the TMDL to EPA. The Department shall:

1. Prepare a draft estimate of the total amount of each pollutant that causes impairment from all sources that may be added to a navigable water while still allowing the navigable water to achieve and maintain applicable surface water quality standards;
2. Determine draft allocations among the contributing sources that are sufficient to achieve the total loadings;
3. Provide public notice and allow for comment on each draft estimate and draft allocation and shall prepare written responses to comments received on the draft estimates and draft allocations;
4. Publish the determinations of total pollutant loadings that will not result in impairment and the draft allocations among the contributing sources that are sufficient to achieve the total loadings that it intends to submit initially to the regional administrator, along with a summary of the responses to comments on the estimated loadings and allocations, in the A.A.R. at least 45 days before the submission of the loadings and allocations to the regional administrator.

Federal law only requires the submittal of the pollutant loadings to EPA for approval. However, the Department considers the pollutant loadings and the draft allocations to be integrally related and that they should be presented together to afford the public a complete understanding of the issues, outcomes and recommendations of the TMDL analysis. For that reason, the Department has combined the loadings and allocations in this publication in the A.A.R.

**B. TMDL for the Little Colorado River Reach 15020002-004**

*Executive Summary*

The Arizona Department of Environmental Quality (ADEQ) 2004 Clean Water Act (CWA) 303[d] List classified the Little Colorado River (LCR) (HUC #15020002-004: from Silver Creek to Carr Wash) as impaired for the aquatic and wildlife - cold water (A&Wc) designated use based on EPA's assessment of turbidity exceedances (eight exceedances in eight assessed events) as evidence of narrative bottom deposits violations. The 2006/2008 ADEQ Water Quality Assessment formally classified the reach as impaired for suspended sediment concentration (SSC) with five of nine rolling geomean determinations exceeding the 80 mg/l criteria in the five-year assessment window. The SSC standard for the aquatic and wildlife cold-water designated use has since been lowered to a 25 mg/l median. Impairment listings result in a total maximum daily load (TMDL) study and report detailing how the impaired waterbody may be brought into attainment of state water quality standards through identification of nonpoint source areas, critical conditions, and percent reductions necessary.

Sampling commenced in 2007 for this TMDL project. Sampling sites were located to take advantage of the presence of a USGS gauge on the LCR at Woodruff, Arizona, and to isolate contributions from the two major subwatersheds feeding the LCR mainstem in the Woodruff vicinity. Seasonality was addressed through sampling at baseflow, spring runoff and storms. All sampling was done via grab sampling methods. TMDL sampling included a minimum of two baseflow, four storm, and one spring melt events. Water samples were analyzed for SSC using Method ASTM D3977C, which reported results in concentrations split between the fine fraction (particles less than 2 mm diameter) and the coarse fraction (particles greater than 2 mm diameter).

Load duration curves were used for modeling SSC loads and calculating the TMDL target values for Reach 15020002-004. The load duration curve approach was chosen for its flexibility, its capacity to identify and address flow-dependent conditions, and the ability to classify and analyze various data points individually in accordance with the requirements of Arizona's water quality standard for SSC. Long-term USGS streamflow gauges in the watershed permitted an in-depth examination of flow history.

The cumulative data for the LCR at Woodruff indicates that reductions are called for in all five flow classes, though insufficient nonstorm data is available to quantify reductions for the upper three flow classes. Specific load allocation reductions necessary are 99.8 percent and 93.1 percent for the dry condition and low flow classes respectively. In neither of these classes were any contributions from the LCR above the Silver Creek confluence present; all necessary quantifiable reductions are attributable to the Silver Creek watershed alone.

Loads are exceeding the system's assimilative capacity in nonstorm conditions (outside of a 48 hour exclusion window, as required by the SSC water quality standard) due almost entirely to contributions from the perennial Silver Creek watershed. Loading is further exacerbated by contributions from the LCR subwatershed above the Silver Creek confluence in those few events where the LCR above Silver Creek is flowing in nonstorm - stable flow conditions; however, these are rare occasions accounting for only a small proportion of time. The 48 hour exclusion window for storm events in the SSC water quality standard greatly reduces the sample population available for evaluation in the upper three flow classes; consequently, sources that contribute on a local basis absent overland flows are implicated in the need for nonpoint source loading improvement. Load duration analysis suggests that local point sources are an issue for the impairment, since low flow categories show problems. Additionally, a mix of run-off from impervious developed areas, and riparian zone/floodplain contributions are contributing stressors. Promise is shown for the improvement of riparian buffers and implementation of filter strips and additional local controls for the areas identified as particular problems. Field reconnaissance, field data, and desktop GIS analyses pinpoint the Shumway-Taylor-Snowflake corridor with its extensive farmland and pasture areas adjacent to Silver Creek, along with urban contributions from the towns in the proximity as being the areas where the most improvement in nonpoint source sediment pollution may be achieved.



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TMDL CALCULATIONS

The TMDL calculations are based on flow and concentration data analyzed using load duration curves.

The TMDL or loading capacity and the resulting load reductions necessary to meet the TMDL is determined using the TMDL equation:

$$\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$$

Where WLA is waste load allocation (point sources), LA is load allocation (nonpoint sources and natural background), and MOS is a margin of safety. Loading capacity, existing loads, and reductions needed for water quality standard attainment are calculated for major tributaries to Reach 004 and their associated subwatersheds.

MARGIN OF SAFETY

A baseline margin of safety of 10 percent is subtracted from the TMDL allowance for each flow class to buffer against uncertainties in the study, including variability of sample concentrations, variability and error associated with flow measurement, and other uncertainties associated with sampling and laboratory analysis. An additional 2 percent margin of safety is applied to account for contributions from the LCR Silver-Carr Lake Draw subwatershed that cannot be isolated from the cumulative SSC values determined at the Woodruff site. The subwatershed is being accounted for in an areal comparison relative to the size of the entire contributing watershed; its area comprises 0.56 percent of total watershed area. The additional 2 percent allowance permits this subwatershed's contributions to be assimilated in the TMDL value without explicit numeric values and adds an additional implicit margin of safety beyond the subwatershed's expected contribution.

WASTE LOAD ALLOCATIONS

*AZPDES/NPDES Permits*

Three AZPDES-permitted facilities exist in the LCR basin upstream of the Carr Lake Draw confluence; though Pinetop-Lakeside's discharge permit expired on January 22, 2012 (the town retains a biosolids operations AZPDES permit). Terms of Permit AZ0026034 (previously Permit AZ0024287) for the Snowflake WWTP present limits for TSS, but SSC is not explicitly addressed in the permit. The terms of the permit fact sheet acknowledge that discharge may reach or affect Silver Creek, and thus the permit was written to protect Silver Creek designated uses. Snowflake WWTP's permit to discharge expired in October of 2009, and Snowflake was granted a renewal of the permit under a new permit number (AZ0026034) in February 2012. Based upon Snowflake WWTP's maximum daily discharge of 0.6 mgd (equivalent to 0.928 cfs), the Snowflake WWTP is assigned a numeric SSC waste load allocation of 56.75 kg/day in the TMDL calculation where flow categories permit, as discussed below.

The Show Low Municipal WWTP (AZ0023841) discharges to constructed wetlands in former playa wetlands (Pintail Lake and Telephone Lake), with provisions made for excess discharges to be diverted or allowed by overland flow to an additional wetland (Ned Lake). The discharges are not expected to enter the hydrologic network and impact the water quality of Silver Creek or the LCR. While the permit lists criteria to be applied to TSS, the suspended sediment concentration water quality standard is not specifically addressed in the permit. Therefore, an SSC concentration-based waste load allocation of 25 mg/l consistent with the criteria of the A&Wc SSC water quality standard is assigned.

The Pinetop-Lakeside Sanitary District WWTP (AZ0025437) formerly discharged to a series of constructed pond wetlands adjacent to an ephemeral tributary of Show Low Creek. Two additional wetlands (Instream Wetland A and Instream Wetland B) were planned at the previous permit renewal to be constructed within the channel of the ephemeral drainage to handle overflow conditions during storm events and to provide additional capacity during the months of April-October. The additional wetlands were designed to allow assimilation of the entire two million gallon per day capacity of the WWTP if necessary. However, Pinetop-Lakeside never constructed the planned overflow wetlands and allowed their discharge permit to expire effective January 22, 2012. The permit was subsequently reissued under the same number effective September 5, 2012 for biosolid operations only with no discharges to waters of the United States authorized. Consequently, no wasteload allocation for AZPDES Permit AZ0025437 is granted or assigned.

There are no NPDES facilities necessitating a WLA within the LCR watershed boundary in the State of New Mexico.

Flows in the LCR at Woodruff are generally low and pose a problem in a load duration analysis incorporating numeric mass-limit based waste load allocations in the low flow (Category 5) classification. The median flow of the low flow category at Woodruff is 0.4 cfs. With a design capacity of 0.6 MGD for the Snowflake WWTP (equivalent to a steady state flow of 0.93 cfs), a potential exists with a numeric mass limit-based WLA for a discharge impacting the impaired reach to exceed the calculated WLA in the lowest flow class at Woodruff if the Snowflake WWTP is discharging at plant capacity. Consequently, a numeric mass limit WLA will only be applied to the upper four flow classes. A concentration-based WLA equivalent to the water quality standard (25 mg/l) for Snowflake will be applied to the low flow class. Since the load duration curve is predicated on the product of discharge and concentration, it can safely be surmised that in these flow categories, if the water quality standard is being met at the Snowflake WWTP outfall, waste loads for the LCR at Woodruff should be in accordance with the TMDL.

Wasteload allocations were developed and applied for the watershed as a whole in keeping with the manner by which load allocations were developed. The TMDL analysis included all subwatersheds and tributaries above the confluence of Carr Lake Draw at the base of the impaired reach; however, the analysis was made without spatial segmentation by subwatershed.

*MSGP and CGP General Permits*

The purpose of Arizona's multi-sector general permit (MSGP) and construction general permit (CGP) is to protect the quality and beneficial uses of Arizona's surface water resources from pollution in stormwater runoff resulting from mining, non-mining, and construction operations and activities. Under the Clean Water Act and Arizona Revised Statutes, it is illegal to have a point source discharge of pollutants that is not authorized by a permit, including stormwater runoff from industrial or construction sites to a water of the United States. To protect water quality, general permits require operators to plan and implement appropriate pollution prevention and control practices for stormwater runoff.

As of fall 2012, 40 permittees were covered under the CGP in the Little Colorado River watershed in Navajo and Apache Counties. The CGP expired for all permittees on February 28, 2013, but it will be renewed for another term on that date. CGP permittees typically operate for short durations of time under permit coverage, and the number of permittees can fluctuate widely over any given period of time. Consequently, CGP permittees will not be itemized in this TMDL.

As of fall 2012, MSGP permittees in the LCR basin in Navajo and Apache counties numbered 17. MSGP activities and facilities are typically ongoing and of longer durations than CGP operations. Details for MSGP permittees are presented in Table 4 of the final TMDL document.

ADEQ will require permittees to meet the terms of the WLA in one of the following ways:

- The SSC numeric standard for cold water streams (25 mg/l) shall be met as a concentration-based wasteload allocation for each of the individual stormwater outfalls or other points of discharge as identified in the permittee's approved SWPPP or
- Permittees can demonstrate through monitoring and reporting that discharges reaching waters with an A&Wc designated use are not causing or contributing to exceedances of the 2009 SSC water quality standard in the receiving waters with the A&Wc use.

The permitting agency may impose additional monitoring requirements to determine compliance in context with the general permit. Specific monitoring requirements and BMP requirements will be addressed in SWPPPs to be reviewed by the ADEQ Stormwater and General Permits Unit, as required in Sections 2.2.2 and 3.1.1 of the 2010 ADEQ Mineral Industry and Industrial MSGP and pertinent sections of the 2008 ADEQ CGP.

*Municipal Separate Storm Sewer System (MS4) Permit*

The Arizona Department of Transportation (ADOT) has state-wide Municipal Separate Storm Sewer System (MS4) permit coverage as a Medium-to-Large municipal operation for its facilities and infrastructure. ADOT operates its stormwater program under a separate individual permit (AZS000018-2008) and program known as the Statewide Stormwater Management Plan (SSWMP). Arizona has several state highways that transit the TMDL watershed, including Highways 77, 277, 260, 180, and 61.

A concentration-based WLA equivalent to the 2009 A&Wc water quality standard for suspended sediment concentration (25 mg/l) is established for existing and future permittees covered under all sectors of the MSGP, CGP, and for the MS4. The point of compliance for WLAs for all discharges from MS4, MSGP, CGP, or individual AZPDES permit operations shall be the point of discharge to a reach carrying an A&Wc designated use.

**LOAD ALLOCATIONS**

Nonpoint source contributions from the watershed may come from either natural background conditions or anthropogenic sources. LAs are calculated by subwatersheds and flow duration categories. Natural background quantification is also accounted for as a separate proration where explicitly allocated.

**LOAD REDUCTIONS**

Load Reductions (LR) are needed when the existing load is larger than the LA calculated using the TMDL equation. The LR can be calculated by:

$$LR = \text{Existing load} - (\text{LA} + \text{Natural background} + \text{MOS})$$

The percent reduction needed is calculated by using:

$$\% \text{ Reduction} = (\text{LR}/\text{Existing Load}) * 100$$

In cases where the LR is negative, no reduction is necessary. These categories are identified as meeting the category allocation. In instances where the inclusion of the margin MOS causes existing loads to exceed the loading capacity, a reduction in the existing load will still be required.

TMDLs identify the amount of pollutant that can be assimilated by the waterbody and still meet water quality standards. The pollutant of concern requiring TMDLs for the Little Colorado Reach 004 is suspended sediment concentration. In order to calculate the load in kilograms per day (kg/day) from discharge in cubic feet per second (cfs) and concentrations in milligrams per liter (mg/l), a conversion factor is required:

$$\text{ft}^3/\text{sec} * \text{mg/l} * 28.32\text{L}/\text{ft}^3 * 86,400\text{sec}/\text{day} * 1 \text{ kg}/1000 \text{ g} * 1\text{g}/1000\text{mg} = 2.446 \text{ kg}/\text{day}$$

The conversion factor of 2.446 was used in the following equation:

$$\text{Existing Load} = Q * [\text{Suspended sediment concentration}] * 2.446 \text{ kg}/\text{day}$$

**Notices of Public Information**

**TABLES**

The following tables detail the TMDL targets and reductions necessary for Reach 15020002-004. Table 1 addresses TMDL targets, wasteload allocations, and cumulative load allocations for each of the five flow classes. Table 2 gives a detailed breakdown of existing mean loads and percentage reductions calculations. Urban load allocations are also itemized and called out as a portion of the total load allocation.

Flows and associated loads and targets are broken out into five categories for each analysis, including high flows (0-10% flows), moist conditions (10-40% flows), mid-range flows (40-60%), dry conditions (60-90%) and low flows (>90% flows).

**Table 1. Reach 15020002-004 TMDL Targets, Wasteload Allocations, and Load Allocations**

**Reach 15020002-004: Little Colorado River, Carr Lake Draw- Silver Creek  
TMDL calculations, Kg/day**

	<i>Category 1</i>	<i>Category 2</i>	<i>Category 3</i>	<i>Category 4</i>	<i>Category 5</i>
	<i>High Flows</i>	<i>Moist Conditions</i>	<i>Mid-Range Flows</i>	<i>Dry Conditions</i>	<i>Low Flow §</i>
<b>90th percentile values</b>					
Cumulative Reach 15020002-004					
TMDL (Kg/day):	14,370	1,162	391	171	24.5
Margin of Safety (12%)	1,724	139	47	21	2.9
TMDL - MOS (Kg/day)	12,646	1,022	344	151	21.5
<b>Little Colorado and Silver Creek Hydrologic Inputs</b>					
Natural Background*	7,553	611	206	90	12.9
Waste Load Allocation	56.75	56.75	56.75	56.75	**
Total Load Allocation	5,086	355	82	3.9	8.7
Sum	12,646	1,022	344	151	21.5

§ - Low flow category uses 92.5 percentile flow to determine target values ;  
Flow class extends only to the 95th percentile before discharge is 0.  
\*\* - Concentration based WLA for Snowflake WWTP in Class 5.

**Table 2. Load Reduction Calculations, Reach 15020002-004**

**Reach 15020002-004: Little Colorado, Silver Creek to Carr Lake Draw  
TMDL Cumulative Reductions  
SSC, Kg/day  
90th P-File**

	<i>Category 1</i>	<i>Category 2</i>	<i>Category 3</i>	<i>Category 4</i>	<i>Category 5</i>
	<i>High Flows</i>	<i>Moist Conditions</i>	<i>Mid-Range Flows</i>	<i>Dry Conditions</i>	<i>Low Flows §</i>
TMDL (Kg/day):	<b>14,370</b>	<b>1162</b>	<b>391</b>	<b>171</b>	<b>24.5</b>
Margin of Safety (12%)	1,724	139	47	21	3
TMDL - MOS (Kg/day)	<b>12,646</b>	<b>1022</b>	<b>344</b>	<b>151</b>	<b>21.5</b>
Reach 15020002-004 Existing	<b>33,549 *</b>	<b>115,676 *</b>	<b>5,255 *</b>	<b>1,665</b>	<b>139</b>
Total Load Allocation	5,086	355	82	3.9	8.7
Urban Load Allocation	87	6.14	1.42	0.07	0.15
Waste Load Allocation	56.75	56.75	56.75	56.75	**
Natural Background	7,553	611	206	90	12.9
Load Allocation Reductions Needed	*	*	*	<b>99.8%</b>	<b>93.1%</b>

§ - Low flow category uses 92.5 percentile flow to determine target values ;  
Flow class extends only to the 95th percentile before discharge is 0.  
\*\* - Concentration based WLA for Snowflake WWTP in Class 5.  
\* - Fewer than four data points in category. Reductions not quantified.

## SUMMARY OF COMMENTS

Comments were received from Region 9 of the USEPA. Below is a summary of the comments and ADEQ's responses.

### **EPA comments**

#### **I. Comments specific to both the SSC and E. coli TMDLs**

##### ***Background Information (TMDL Watershed Boundary)***

1.) *It is unclear which portion of the Little Colorado Basin the TMDLs WLAs and LAs apply to. Please state which subwatersheds these TMDLs are established for. Please also include a map with the watershed boundaries of the TMDLs in the Source Assessment Section. This watershed boundary map should display the city boundaries for any developed areas (Snowflake, Taylor, Shumway) surrounding the major and minor tributaries, and Little Colorado River impaired reach. The reaches of major and minor tributaries as well as the impaired reach should be clearly labeled.*

*Any other developed urban areas described in the TMDLs, should also be included on the above map (Pinetop-Lakeside, Show Low, St. Johns, etc.) or on a separate larger watershed map for spatial clarification.*

A paragraph discussing WLAs and their geographic application was added to both TMDLs (Section 7.3 – SSC; Section 8.3 – *E. coli*) as requested. ADEQ has also added watershed maps with all requested information to Sections 4.0 (SSC TMDL) and 5.0 (*E. coli* TMDL) of the TMDL documents.

##### ***Source Assessment***

2.) *In Section 4.1.1 AZPDES and NPDES Permits, It would be helpful to include a map of the outfall location(s) for the Snowflake WWTP and the Show Low WWTP, with similar contextual information as the watershed boundary map described in the Section 2 Background Information (TMDL Watershed Boundary) comments above.*

A map with contextual information showing outfall locations at both large and small scales for discharging permittees granted a WLA was added to the SSC TMDL (Section 4.1.1) and the *E. coli* TMDL (Section 5.1.1).

3.) *In Section 4.1.2 General Permits, Current and Future Permittees, it is unclear how many permittees are covered under the Non-Mining MSGP, Mining MSGP, and CGP permits, and where in the TMDL watershed they are located. Please provide the number of active permittees currently covered under each permit in this section. In addition, please provide in Section 7 TMDL Calculations (or as an Appendix to the TMDL), a list of entities covered under the above listed permits.*

ADEQ has considered EPA's request and added tables to both TMDLs (Section 5.1.5 – *E. coli* TMDL; Section 4.1.2 - SSC TMDL) detailing all updated MSGP (Mining; Non-mining; Mining & Non-mining) permittees in the TMDL watershed as of the fall of 2012, as these permittees tend to be associated with facilities and operations of long-standing duration. CGP permittees have not been itemized in the same fashion due to the rapid turnover in permittees covered under the general permit, the transient and localized nature of these permit operations, and the recognition that any itemization published in the TMDL would be outdated before final approval of the documents. The number of permittees under CGP coverage in the TMDL watershed declined from over 70 to less than 40 while the TMDL was being finalized in just the last year. ADEQ has included updated numbers as of the fall of 2012 of permittees covered under both types of general permits in the named sections.

##### ***TMDL Calculations***

4.) *The TMDL states that (for the Show Low WWTP): "...it is unlikely that the discharges would enter the hydrological network and impact the water quality of Silver Creek or the LCR..." (pg. 33, SSC TMDL). However, the TMDLs for SSC and E. coli establish a SSC WLA for the Show Low WWTP at 25 mg/L as a concentration load, and an E. coli WLA at 576cfu/100mL. The TMDLs should make a determination on whether or not discharges from the Show Low WWTP have the potential to contribute E. coli and SSC loads to Silver Creek and the Little Colorado River. If there is potential to contribute E. coli and SSC loads, then the concentration based WLA appears appropriate. However, the implementation procedures may wish to consider how the WLA can account for the existing treatment provided in the wetlands after the outfall discharge point. If no potential exists, then applying a concentration based WLA would place an unnecessary compliance limit on the WWTP.*

ADEQ has standardized the language between the two TMDLs to make it clearer that ADEQ's determination is that Show Low WWTP discharges are not expected to add loading to the LCR hydrologic network. However, ADEQ has included a WLA for both SSC and *E. coli* for this facility to be consistent with the permit that has been granted authorizing discharges to a water of the United States. The WLA was established consistent with permit terms and/or water quality standards, and any discharges that meet permit terms (or water quality standards, where permit terms do not address the constituent of concern), will be consistent with the provisions governing the implementation of the TMDL even if the discharges enter the hydrologic network in extreme events.

5.) *For the WLAs established for the MSGP, CGP, and WWTPs, please state where (e.g., location) the dischargers are expected to meet the WLAs (i.e., point of compliance).*

Language has been added addressing the points of compliance for each TMDL in Section 7.3 (SSC TMDL) and Section 8.3 (*E. coli* TMDL).

6.) *Table 8 Sample Population (SSC TMDL) and Table 6 (E. coli TMDL) includes the number of samples analyzed from 3 monitoring stations. Please include tables (or add to these tables) that describe the locations, E. coli and SSC*

exceedance data, and dates for each of these three monitoring locations (and any other relative samples) used in the TMDLs to assess the magnitude and sources of impairment.

Tables have been added to both TMDLs detailing the specific sampling sites, dates, flows, concentrations, loads and categories of flow for exceedance events considered in the TMDL analysis. The tables may be found in Section 8.5 (*E. coli* TMDL) and Section 7.5 (SSC TMDL).

7.) *The SSC TMDL establishes a LA for the entire Watershed, and the E. coli TMDL establishes a LA for each of the 3 Subwatersheds. In the SSC TMDL the urban areas are pinpointed as contributing to nonpoint source sediment loads (“the Shumway-Taylor- Snowflake corridor”). In the E. coli TMDL, it is suggested that stormwater runoff from impervious developed areas contributes to the bacteria exceedances. We suggest that these urban areas be assigned a portion of the LA relative to their contribution of the non-point source load.*

ADEQ has added separate line items in the TMDL breakdown tables (Table 12 – SSC; Table 10 – *E. coli*) for urban contributions to both *E. coli* and SSC loading of the Little Colorado River. These line items, though present in a summation table, are not values considered in the summations, but rather a portion of the total load allocation from the pertinent subwatershed. Urban fractions of the total load allocation were developed and incorporated on a percent area basis for the incorporated town areas relative to either the subwatershed area (for the *E. coli* analysis) or to the total watershed area (for the SSC analysis). A table was included in the *E. coli* document detailing the subwatershed figures used to establish the percentages. It is noted in the narrative and cautioned here that TMDL sampling did not attempt to isolate urban loading apart from total loading; no conclusions can be drawn from the TMDL regarding reductions that may or may not be necessary for urban runoff.

## **II. Comments specific to the SSC TMDL**

### **Section 1 Executive Summary**

8.) *The first paragraph of Section 1, page 6, appears to have an error. The reach is described “...as impaired for the Full body Contact (FBC) uses based on EPA’s assessment of turbidity exceedances...” EPA understands that the reach is impaired for Aquatic and Wildlife cold (A&Wc) designated uses, and this sentence should be revised to reflect the A&Wc impairment for SSC.*

This error has been corrected.

### **Section 4 Source Assessment**

9.) *In the Section 4.1.1 AZPDES and NPDES Permits, Does SSC (or related data such as TSS) effluent or ambient monitoring data exist for the Snowflake WWTP? If so, this information should be included in the source assessment section.*

No SSC data from Snowflake discharge monitoring reports (DMRs) is available for incorporation, as SSC is not a constituent addressed in the permit for the wastewater facility. TSS is a constituent represented in permit terms. However, a review of DMRs for the previous three years has determined that no monthly discharge has been reported for any month in the three year period, as the Snowflake WWTP normally re-uses all of its effluent for other purposes; consequently, there is no TSS data available to report or incorporate.

10.) *Arizona Department of Transportation (ADOT) appears to own property (State Route 77 and 277) within the watershed and near the impaired reach of the Little Colorado River and nearby tributaries, however they are not mentioned in the TMDL. Should the Statewide ADOT MS4 be included in the TMDL and assigned a WLA? If a WLA is not clearly defined, then their WLA is equal to zero.*

Thank you for bringing this oversight to our attention. Several Arizona highways transit the TMDL watershed, including State Highways 77, 277, 260, 61 and 180. Language was added to the TMDL addressing the MS4 and granting the MS4 a concentration-based WLA in Sections 4.1.1 and 4.1.2.

### **Section 7 TMDL Calculations**

11.) *For the Snowflake WWTP the SSC TMDL establishes a concentration-based WLA equivalent to the water quality standard (25 mg/l) at the low flow class, while establishing a load-based WLA (56.75 kg/day) at the 4 higher class flow rates. It is unclear how this bifurcation of load and concentration WLAs will be implemented in the NPDES permit. The TMDL should provide a recommendation for NPDES implementation.*

The load bifurcation is an artifact of the difference in flows from discharge capacities compared to the impaired reach in the low flow class. The split in method of analyzing was necessary to fulfill the constraints of TMDL equations. Federal courts have ruled (*Friends of the Earth, Inc. v. EPA, D.C. Circuit Court Opinion, April 2006*) that daily loads are to be employed wherever possible consistent with TMDL objectives as originally legislated in the Clean Water Act; EPA guidance in the wake of this decision (Grumbles memo dated Nov. 15, 2006) reaffirms this approach of giving daily load expressions primacy over other methods of expression such as concentration-based approaches. ADEQ has used this load expression approach for every flow category in the impaired water reach that could accommodate it. However, the low flow category median flow is less than the discharge capacity of the Snowflake WWTP, which would lead to an obvious incompatibility if a mass-based expression predicated on a flow higher than a demonstrated representative category flow was used. Consequently, ADEQ had to revert to establishment of a concentration-based WLA in the low flow class.

ADEQ does not consider that this bifurcation done for the purpose of calculating the TMDL value for every flow class that could support it changes in any way the existing permit conditions or implicit requirements for water quality standard adherence in receiving waters for the Snowflake WWTP. Concentration-based values as stated in Ari-

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zona's water quality standards are implicitly in effect for all discharges of the WWTP to receiving waters with an A&Wc designated use, from low flow up to maximum discharge capacity. Since the TMDL WLA is based on and calculated from those concentrations, the load-based values for the upper flow classes are simply another way of presenting the same discharge condition for the WWTP, at flows that permit the use of this approach in a mathematically-consistent manner in the TMDL. ADEQ believes that no recommendation for implementation is necessary, because no discharge conditions differing from the permit conditions or the receiving water's water quality standards are being placed on the WWTP.

12.) *Additionally, the load-based WLA for Snowflake establishes the WLA based on the maximum design capacity flow of the WWTP (0.6 mgd). Please clarify - Why the TMDL does not establish the WLA based on actual, average flows at the WWTP, which are typically much less than the maximum design capacity? By establishing the WLA based on maximum capacity flow, the TMDL appears to allow the WWTP to discharge SSC at a concentration higher than the water quality standard.*

The Snowflake plant typically does not discharge any of its water to the hydrologic system, but instead re-uses its effluent for irrigation and groundwater recharge adjacent to the site. Monitoring reports for the last three years show no discharge reported for more than 30 prior monthly reports (the remainder are still pending reporting). Consequently, the monthly flow average for recent years is consistently 0 cfs. However, the Snowflake WWTP has applied for and been granted a permit that authorizes discharges to waters of the United States, and the load capacity of Silver Creek and the LCR can accommodate Snowflake's WWTP discharge up to water quality standards. ADEQ has therefore granted a wasteload allocation consistent with Arizona's water quality standard for Silver Creek, even though in practice, Snowflake typically will not need to invoke the WLA. ADEQ bases and calculates all of its mass-based WLAs on concentrations as stated in either permits or water quality standards, unless a receiving water's flow capacity is insufficient to accommodate this mathematical convention.

**Calculation of Natural Background Determination in the SSC TMDL**

13.) *In Section 6.2 Natural Background Determination, Silver Creek is identified as the natural background waterbody for the watershed, with sampling from four different locations in Silver Creek. EPA is concerned that "natural background" data may have been collected near urban areas such as Show Low, or the Shumway-Taylor-Snowflake corridor. Please provide a map that describes where the natural background sampling locations are along Silver Creek, and further justification as to why the particular section of Silver Creek was used to determine the natural background contribution.*

Sampling sites used for natural background determination have been added to the watershed map in Section 4.0, where it is apparent on visual examination that the headwaters of Silver Creek and Brown Creek (Silver Creek's feeder tributary) are not in proximity to any incorporated or populated area. There are no anthropogenic influences affecting drainage to the headwaters from Show Low or Pinetop-Lakeside, since these towns are located in a different subwatershed from Silver Creek. Show Low Creek, the subwatershed of the towns mentioned, joins Silver Creek below natural background sampling sites. Data for natural background determination was also collected well above Shumway-Taylor-Snowflake corridor; there are no impacts from these communities on natural background values. The map added by EPA's request to the TMDL document (Section 4.0) clarifies the drainage patterns of Silver Creek and its tributaries. Brown Creek, the formal headwaters for Silver Creek has little to no anthropogenic influence affecting sediment values. TSS values from historic data for Brown Creek range in the single digits (mg/l), and turbidity values are below 10 NTUs. The area of the headwaters is of high water quality in pinyon-juniper woodland and ponderosa pine forest.

The area selected for natural background sampling sites is not pristine; no areas in the watershed exhibited a complete lack of anthropogenic influence that met the requirements of perennial flow, sufficient hydrologic process to be representative, and similar soil erosivity to the impaired reach. However, the sites selected represented the best possible compromise available for sampling in the LCR/Silver Creek watershed – high enough in the watershed to minimize anthropogenic impacts, and low enough below the headwaters to allow Silver Creek's hydrologic process to establish its typical concentration-carrying capacity for sediment loads.

ADEQ was severely constrained in its alternatives for a natural background determination for the LCR SSC TMDL due to very limited perennial water sources in the TMDL watershed and the necessity of locating sampling sites in soils that bore some erosivity similarity to the highly erodible soils found in the impaired reach. The area ultimately selected was the fourth area sampled and analyzed, and the only one found suitable for realistic natural background numbers that met all criteria. The area selected for the sampling sites is several miles downstream from the headwaters in a rural area, in and immediately below an Arizona Game and Fish preserve that serves as a fish hatchery for the area.

A paragraph providing justification of the selection has previously been included in Section 6.2 of the TMDL.

**4. Name and address of agency personnel with whom persons may communicate:**

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Copies of the final TMDL may be obtained from the Department by contacting the numbers above. The final TMDL may also be downloaded from the Department's web site at: <http://www.azdeq.gov/ environ/water/assessment/status.html>.