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 ENVIRONMENTAL QUALITY

[M11-356]

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 TMDLs for the Gila River (Reaches 15040005-022, 15040002-004) 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 "Gila River Total Maximum Daily Loads for *Escherichia coli*" was published in *The Eastern Arizona Courier* and *The Copper Era*, newspapers of general circulation in the affected area, on January 12, 2011. The public comment period ended on February 11, 2011.

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. That is, do 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 comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 2.1: Publication of these TMDLs in the 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, and provide public notice and an opportunity for comment in a newspaper of general circulation in the affected area;
2. Publish a notice in the A.A.R. (this notice) of the determination of total pollutant loadings that will not result in impairment, a summary of comments received to the initial TMDL public notice, and the Department's responses to the comments;
3. Make reasonable and equitable allocations among TMDL sources, and provide public notice and an opportunity for comment in a newspaper of general circulation in the affected area;
4. Publish a notice in the A.A.R. (this notice) of the allocations among contributing sources, along with responses to any comments received on the draft allocations in a newspaper of general circulation.

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 Gila Rive Reaches 15040005-022 and 15040002-004

EXECUTIVE SUMMARY

Section 303(d) of the Clean Water Act requires each state to develop TMDLs for surface waters that do not meet and maintain applicable water quality standards. A TMDL establishes the amount of a given pollutant that the waterbody can withstand without creating an impairment of that surface water's designated use. The TMDL by definition (40 Code of Federal Regulations Part 130) is the sum of all point and non-point sources with the inclusion of a margin of safety and an allocation for natural background levels.

Reach 15040005-022 (Gila River – Yuma Wash to Bonita Creek) and Reach 15040002-004 (Gila River – Bitter Creek to New Mexico State Line) are listed on Arizona's 303(d) list of impaired waters for exceedances of the state's *Escherichia coli* (*E. coli)* standard. Reach 15040005-022 was first listed for *Escherichia coli* in 2004, and it remains on the state's 303(d) list for the 2006/2008 assessment. Reach 15040002-004 was listed for *E. coli* in the 2006/2008 assessment. This TMDL was undertaken in late 2006 for both reaches to establish allocations for attainment of Arizona's water quality standard.

Sampling undertaken in 2007, together with previous Arizona Department of Environmental Quality (ADEQ) ambient monitoring data and historic United States Geologic Survey (USGS) flow history and *E. coli* data, comprised the data set from which allocations were drafted and reductions were calculated. TMDL sampling covered all parts of the annual hydrograph at a number of sampling locations intended to isolate perennial tributary contributions and contributions from reach subwatersheds and the State of New Mexico. Base and storm flow data for both winter storms and summer monsoons were sampled to obtain a comprehensive picture of the critical conditions affecting *E. coli* loads in the watershed.

Allocations and load reductions were parsed into five categories of flow conditions representing the entire range of flows from flood conditions to historic low flows and summarized in tabular form. Because the geometric mean as used in Arizona's standard is not a conservative value in a mass-balance analysis (Parkhurst, 1998), data sets were also calculated as arithmetic means and reductions. While geometric means are the controlling numbers for cumulative watershed reductions, arithmetic means, which are amenable to allocation and proration, are the numbers on which subwatershed reductions are presented. A separate analysis on single sample maximums for both reaches was performed evaluating the 90th percentile value of existing loads against load duration estimates using the state's single sample maximum standard by category and site flow histories. Considered together, the two analyses lay out needed reductions for both long-term (mean) and daily (single sample maximum) evaluations of progress towards attaining Arizona's *E. coli* water quality standard.

Analysis determines that mean reductions are needed in the top flow category consisting of high flows for both reaches, with the moist conditions category provisionally flagged for reductions in Reach 004. Single sample maximum reductions are needed in two of the five top flow categories for Reach 15040005-022 and two of the five flow categories for Reach 15040002-004, with another two categories flagged due to insufficient samples. However, for mean reductions, the contributing subwatershed analysis for perennial tributaries consistently found that excessive loading was only occurring in high flow events. An earlier analysis, not detailed in this TMDL analysis, found that

almost all exceedance events for the two listed reaches were related to demonstrable flow elevations and hydrograph spikes due to precipitation events. The San Francisco River and the Gila River–Yuma Wash to Bitter Creek subwatershed are the heaviest load contributors in the nonattaining category for Reach 022. For Reach 004, the State of New Mexico, given a load allocation equivalent to the Arizona water quality standard at the state line, is contributing excessive *E. coli* loading in high flow events.

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 are calculated for major perennial tributaries and their associated subwatersheds, at the New Mexico state line, and for remaining subwatershed areas of the Gila River to the base of the lowest impaired reach exclusive of other subwatershed inclusion.

MARGIN OF SAFETY

The purpose of a MOS is to provide for uncertainty in the calculations. A margin of safety of 10% was explicitly called out in the calculation of the TMDLs for both reaches by category. The MOS was applied to determinations of both the mean TMDL values and the single sample maximum values.

Margins of safety may also be implicit in nature by the adoption of conservative assumptions in the analysis. A requirement for the 90th percentile of datasets for each category to adhere to the target value for single sample maximum analyses constitutes a major implicit margin of safety used in the study. This percentile is more protective of water quality than the 75th percentile which had historically evolved in national studies constituting the origins of many state's bacteria water quality standards and which now serves as the basis for Arizona's single sample maximum standard value.

WASTE LOAD ALLOCATIONS

Freeport McMoran, Inc. is currently the only permittee in the Upper Gila watershed covered under the Multi-Sector General Perrmit (MSGP) which regulates stormwater discharges from permittee property. Freeport's MSGP coverage commenced with their discontinuance of their AZPDES permit in May of 2010.

E.coli found in stormwater samples discharging from Freeport's identified stormwater basins is considered attributable to general watershed processes and will be subsumed under the load allocation for the San Francisco River or Eagle Creek subwatersheds. Consequently, after consultation with EPA, a wasteload allocation for Freeport McMoran is not considered necessary.

For possible future permittees seeking similar coverage under the multi-sector general permit (MSGP), the 2009 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. Permittees' adherence to these criteria will be considered consistent with the provisions governing the remainder of this TMDL. ADEQ does not expect that stormwater run-off from MSGP sites will 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 only one sample per seven day interval.

For possible future permittees seeking coverage under the construction general permit (CGP), a concentration-based waste load allocation of 235 cfu/100 ml for single samples is established consistent with the provisions governing the remainder of this TMDL. ADEQ does not expect that stormwater run-off from CGP sites will 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 only one sample per seven day interval. Permittees' adherence to these criteria will be considered consistent with the provisions governing the remainder of this TMDL.

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.

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:

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

The percent reduction needed is calculated by using:

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

In cases where the LR is negative, no reduction is necessary. 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.

Gila River TMDLs

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 Gila River Reaches 022 and 004 is *E. coli*. In order to calculate the load in giga (billion)-organisms per day (G-org/day) from discharge in cubic feet per second (cfs) and concentrations in colony forming units(org)/100 ml, a conversion factor requires calculation:

ft^3/sec * 28.32L/ft^3 * 86,400sec/day * org/100 ml * 1000ml/1L * 1G-org/1E09 org = 0.02446 G-org/day

The conversion factor of = 0.02446 G-org/day was used in the following equation:

Existing Load = Q * [*E. coli* density] * 0.02446 G-org/day

Where Q is discharge in cubic feet per second.

TABLES

The following tables detail the TMDL targets and reductions necessary for Reaches 15040005-022 and 15040002-004. Tables 1-4 cover Reach 22, while Tables 5-8 address Reach 4. Table 9 summarizes TMDL calculations for each of the four combinations of reaches for geomean values and single sample maximum (SSM) values.

Table 1 addresses TMDL targets, subwatershed allocations, and a summary of percentage reductions necessary for the *E. coli* mean value in Reach 22. Table 2 gives a detailed breakdown of existing mean loads and percentage reductions calculations for each subwatershed analyzed in the Reach 22 analysis. Table 3 addresses TMDL targets, subwatershed allocations, and a summary of percentage reductions necessary for the *E. coli* single sample maximum value in Reach 22. Table 4 gives a detailed breakdown of existing single sample loads and percentage reductions calculations for each subwatershed analyzed in the Reach 22 analysis.

Tables 5-8 repeat the same format and ordering (mean allocations, detailed mean reduction calculations, SSM allocations, detailed SSM reduction calculations) for Reach 4. 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).

RESULTS AND DISCUSSION

Examinations of compiled figures show that cumulative geomean value reductions are called for in the high flow category for Reach 15040005-022. Analysis of contributing subwatersheds by arithmetic means indicates that the high flow category presents load values not consistent with the water quality standard (Table 2), but with percentage reductions needed which are less than the cumulative arithmetic mean percent reduction for contributing subwatersheds. The Gila River to the NM state line, Gila River –Yuma Wash to Bitter Creek, and San Francisco River all show this pattern. Bonita Creek and Eagle Creek had insufficient samples to assess in Category 1. In the other four flow categories of the geomean analysis, existing cumulative loads for Reach 22 met TMDL load allocation values; consequently, analysis by subwatershed is not pursued for these categories. The Gila River Bitter Creek to NM State line subwatershed showed attainment in the high flow category, but is provisionally non-attaining with load allocations in the moist condition category (due to insufficient number of samples). The Gila River subwatershed from Yuma Wash to Bitter Creek followed the load assessments of the larger cumulative watershed, showing non-attainment in Category 1. It should be noted that these values are prorated values from the existing cumulative load for the Gila River at Solomon. In several category instances, assessments and load reductions are only provisionally flagged for either attainment or non-attainment, since fewer than four data points comprise the existing means. Reductions called out for Reach 022 range from 32.8% to 68.0%.

Reach 004 when considered in its own right showed the same larger pattern of non-attainment in Category 1 (high flows), while meeting allocations in the two of the remaining four categories. The other two categories could not be assessed. Analysis of the contributing subwatersheds (Table 6) showed a similar pattern to Reach 022's analysis; the Gila River watershed from headwaters to the New Mexico state line requires reductions only in the high flow category, while quantified high flow reductions were called for in the Bitter Creek subwatershed. Reductions range from 16.9% to 77.6%, but again are not definitively assessed in select categories due to sparse data sets.

For Reach 022, single sample maximum analysis demonstrated substantial reductions necessary in Categories 1 and 2 with marginal reductions necessary in Category 3. Category 1 necessary reductions exceed an order of magnitude at 94.9%. Three of the five contributing subwatersheds for which figures are determinable (Table 4) show reductions necessary in only the high flow category. Reductions approach or exceed an order of magnitude in the high flow category for the San Francisco River, and Gila River from headwaters to the NM state line. The sole subwatershed where problems are evident through a majority of the flow categories is the Gila River- Bitter Creek to headwaters watershed, where quantifiable reductions are called for in two of five categories ranging from 59% to 80% and provisional flags are raised in another two categories. Again, certain categories are not adequately represented by sufficiently large data sets, so some assessments and reductions are not presented.

As Reach 004 single sample maximum loads established by load duration curves are determined by independent analyses for each subwatershed, and are not subject to nesting, proration, or summation, similar percentage reductions are called for in the Bitter Creek to headwaters watershed as for Reach 022 detailed above (Table 8). The difference arises from an application of a 10% margin of safety directly to this reach's targets. Percentage reductions in Catego-

ries 1, 2, 4 and 5 range from 63% to 82%. Reductions from the Gila River in New Mexico are called for in only the high flow category, and approach an order of magnitude in size.

Table 1. Reach 15040005-022 Mean Load Allocations and Summary of Reductions

Reach 15040005-022: Gila River - Yuma Wash to Bonita Creek
TMDL calculations, Mean values, G-org/day

Total Watershed Area, Sq Mi.	Percentage Watershed Area		*Category 1*	*Category 2*	*Category 3*	*Category 4*	*Category 5*
		Cumulative *E. coli* Target Values	*High Flows*	*Moist Conditions*	*Mid-Range Flows*	*Dry Conditions*	*Low Flows*
7,902.37	100.000%	Reach 15040005-022					
		Geomeans (G-org/day):	5,393	1,113	542	327	151
		Arithmetic Means (G-org/day):	29,454	3,113	1,742	12,016	10,377
		Ratios, Log geomean to Log mean	0.835021	0.872077	0.8436565	0.6162465	0.542576
		Load Allocations by Subwatershed					
		(Allocated by Arithmetic Mean Values, G-org/day)					
2,793.68	35.352%	San Francisco River	9,000	951	532	3,671	3,171
3,345.81	42.339%	Gila River- Headwaters to NM state line	10,775	1,139	637	4,396	3,796
664.09	8.404%	Eagle Creek	2,166	229	128	884	763
394.81	4.996%	Gila River, Yuma Wash - Bitter Creek	1,271	134	75	519	448
314.30	3.977%	Bonita Creek	984	104	58	401	347
389.68	4.931%	Gila River, Bitter Creek - NM state line	1,255	133	74	512	442
		Waste Load Allocations	0	0	0	0	0
		Margin of safety: 10%	2,945	311	174	1,202	1,038
		Cumulative Natural Background, G-org/day (3.99%):	1,058	112	63	431	373
		TMDL, Arithmetic Means, G-org/day:	29,453 +	3,113	1,742	12,015 +	10,377

Means Reduction Summary Table		*Category 1*	*Category 2*	*Category 3*	*Category 4*	*Category 5*
	Reductions Needed:	*High Flows*	*Moist Conditions*	*Mid-Range Flows*	*Dry Conditions*	*Low Flows*
Geometric Mn	Cumulative,	**73.8%**	**Meets**	**Meets**	**Meets**	**Meets**
Arithmetic Mn	Reach 15040005-022	**68.0%**	**Meets**	**Meets**	**Meets**	**Meets**
Arithmetic Mn	San Francisco River	**41.5%**	--	--	--	--
Subwatershed	Gila River- Headwaters to NM state line	**32.8%**	--	--	--	--
Breakdown	Eagle Creek	*	--	--	--	--
	Bonita Creek	*	--	--	--	--
##	Gila River - Bitter Creek - NM state line	**Meets**	*	**Meets**	**Meets**	*
	Gila,Yuma Wash - Bitter Creek	**68.0%**	--	--	--	--

\+ Figure reflects rounding differences from stated target value. Target value above applies as the TMDL
* Insufficient data: fewer than four data points in the mean. Reductions if necessary not quantified.
All categories of loads and targets listed; segment on state's 303(d) list of impaired waters for E. coli.

Table 2. Reach 15040005-022 Mean Load Reduction Calculations

TMDL Cumulative Reduction Assessments, Geometric Means, G-org/day		*High Flows*	*Moist Conditions*	*Mid-Range Flows*	*Dry Conditions*	*Low Flows*
Reach 15040005-022 Existing		**17,771**	**542**	**24**	**35**	**8**
Reach 15040005-022 Target TMDL		5,393	1,113	542	327	151
Reach 15040005-022 Target - 10% MOS		4,854	1,001	488	294	136
Reach 15040005-022 Natural Background (composite)	**0.0399**	110	23	11	7	3
Reach 15040005-022 Load Allocation		**4,743**	**979**	**477**	**287**	**133**
Reductions Assessment		**73.8%**	**Meets**	**Meets**	**Meets**	**Meets**
TMDL Reduction Calculations, Arithmetic Means G-org/day						
Reach 15040005-022 Existing		79,447	3,361	333	158	13
Reach 15040005-022 Target TMDL		29,454	3,113	1,742	12,016	10,377
Reach 15040005-022 Target - 10% MOS		26,509	2,802	1,568	10,814	9,339
Reach 15040005-022 Natural Background (composite)	**0.0399**	**1058**	**112**	**63**	**431**	**373**
Reach 15040005-022 Load Allocation		**25,451**	**2,690**	**1,505**	**10,383**	**8,967**
Reductions Needed		**68.0%**	Meets **$**	Meets	Meets	Meets
Contributing watershed calculations, Arithmetic Means G-org/day						
San Francisco River - Existing		**15,376**	--	--	--	--
San Francisco River - Target		9,371	--	--	--	--
San Francisco Natural Background	**0.0397**	**372**	--	--	--	--
San Francisco Load Allocation (-NB)		**8,999**	--	--	--	--
Reductions Needed		**41.5%**	--	--	--	--
Eagle Creek Existing		**8,962** *	--	--	--	--
Eagle Creek Target		2,228	--	--	--	--
Eagle Creek Natural Background	**0.0278**	**62**	--	--	--	--
Eagle Creek Load Allocation (-NB)		**2,166**	--	--	--	--
Reductions Needed		*	--	--	--	--
Bonita Creek Exisitng		**4** *	--	--	--	--
Bonita Creek Target		1,054	--	--	--	--
Bonita Creek Natural Background	**0.0667**	**70**	--	--	--	--
Bonita Creek Load Allocation (-NB)		**984**	--	--	--	--
Reductions Needed		*	--	--	--	--
Gila River- Headwaters to NM State Line Existing		**16,039**	--	--	--	--
Gila River- Headwaters to NM State Line Target		11,223	--	--	--	--
Gila HW-NM Natural background	**0.0400**	**449**	--	--	--	--
Gila, HW-NM, Load Allocation (-NB)		**10,774**	--	--	--	--
Reductions Needed		**32.8%**	--	--	--	--
## Gila River - Bitter Creek - HW Cumulative Exisitng		**7,391**	**3,696** *	**27**	**986**	**13** *
Gila, Bitter-NM State Line, Area weighted Coefficient		0.1043	0.1043	0.1043	0.1043	0.1043
## Gila, Bitter-NM State Line, Existing Prorated		**861**	**430**	**3**	**115**	**1**
## Gila, Bitter Creek - NM State Line Target		1,307	138	77	533	461
Gila, Bitter Creek - NM State Line Natural Background	**0.0400**	**52**	**6**	**3**	**21**	**18**
Gila River - Bitter Creek - NM State Line Load Allocation		**1,255**	**133**	**74**	**512**	**442**
Reductions Needed		**Meets**	*	**Meets**	**Meets**	*
Gila,Yuma Wash - Bitter Creek Existing**		**3,969**	--	--	--	--
Gila,Yuma Wash - Bitter Creek Target		1,324	--	--	--	--
Gila,Yuma Wash - Bitter Creek Natural Background	**0.0400**	**53**	--	--	--	--
Gila,Yuma Wash - Bitter Creek Load Allocation		**1,271**	--	--	--	--
Reductions Needed		**68.0%**	--	--	--	--

* Insufficient data: fewer than four data points in the mean. Reductions not quantified.

** Modeled Values - derived from area-weighted percentage of cumulative load.

All categories of loads and targets listed; segment on state's 303(d) list of impaired waters for E. coli.

$ Geometric mean for category meets criteria; Arithmetic mean reduction disregarded

Table 3. Reach 15040005-022 Single Sample Maximum Thresholds and Summary of Reductions

Reach 15040005-022: Gila River - Yuma Wash to Bonita Creek
TMDL calculations, G-org/day

90th percentile values	*Category 1 High Flows*	*Category 2 Moist Conditions*	*Category 3 Mid-Range Flows*	*Category 4 Dry Conditions*	*Category 5 Low Flows*
Reach 15040005-022 Single Sample Maximum Targets (G-org/day):	10,059	2,075	1,012	609	282
90th percentile values by Subwatershed					
San Francisco River	4,524	925	431	287	149
Gila River, NM state line - Headwaters	4,466	1,069	529	345	115
Gila River, Bitter Creek - Headwaters	5,340	1,132	523	264	9
Eagle Creek	891	230	167	115	75
Bonita Creek	92	34	24	17	10
Gila River, Yuma Wash - Bitter Creek	**	**	**	**	**

Reductions Summary Table	**Reductions Needed:**	*Category 1 High Flows*	*Category 2 Moist Conditions*	*Category 3 Mid-Range Flows*	*Category 4 Dry Conditions*	*Category 5 Low Flows*
Cumulative	Reach 15040005-022	**94.9%**	**78.2%**	**5.8%**	**Meets**	**Meets**
	San Francisco River	**87.7%**	**Meets**	**Meets**	--	--
	Gila River- Headwaters to NM state line	**88.0%**	**Meets**	**Meets**	--	--
	Eagle Creek	*	*	**Meets**	--	--
	Bonita Creek	*	*	**Meets**	--	--
##	Gila River, Bitter Creek - Headwaters	**59.6%**	*	**Meets**	**80.1%**	*
	Gila River, Yuma Wash - Bitter Creek	**See cumulative reductions called for above**				

* Insufficient data: fewer than four data points in the dataset. Reductions if necessary not quantified.
** Subwatershed 90th percentile values cannot be called out independently from cumulative watershed 90th percentile values.
All category loads and targets called out; segment listed on state's 303(d) impaired waters list for E. coli

Table 4. Reach 15040005-022 Single Sample Maximum Load Reduction Calculations

Reach 15040005-022: Gila River - Yuma Wash to Bonita Creek

TMDL Cumulative Reductions **Single Sample Maximums,G-org/day** **90th Percentile E. coli Target Values**		*Category 1* *High Flows*	*Category 2* *Moist Conditions*	*Category 3* *Mid-Range Flows*	*Category 4* *Dry Conditions*	*Category 5* *Low Flows*
Reach 15040005-022 Existing Data		**176,626**	**8,560**	**967**	**425**	**25**
Reach 15040005-022 Target TMDL		10,059	2,075	1,012	609	282
Reach 15040005-022 Load Allocation		**9,053**	**1,868**	**910**	**548**	**253**
Waste Load Allocation		0	0	0	0	0
Natural Background	$	3,762	776	378	228	105
Reductions Needed		**94.9%**	**78.2%**	**5.8%**	**Meets**	**Meets**
TMDL Reduction Calculations, 90th percentile G-org/day						
San Francisco River - Existing		**36,920**	**179**	**173**	--	--
San Francisco River - Target		4,524	925	431	--	--
Natural Background		1,760	360	168	--	--
Reductions Needed		87.7%	**Meets**	**Meets**	--	--
Eagle Creek Existing		**16,057** *	**37** *	**1.6**	--	--
Eagle Creek Target		891	230	167	--	--
Natural Background		61	16	11	--	--
Reductions Needed		*	*	**Meets**	--	--
Bonita Creek Exisitng		**9.2** *	**0.2** *	**8.0**	--	--
Bonita Creek Target		92	34	24	--	--
Natural Background		42	15	11	--	--
Reductions Needed		*	*	**Meets**	--	--
Gila River- Headwaters to NM State Line Existing		**37,081**	**302**	**133**	--	--
Gila, HW-NM, Target		4,466	1,069	529	--	--
Natural Background		1,670	400	198	--	--
Reductions Needed		88.0%	**Meets**	**Meets**	--	--
## Gila River - Bitter Creek - HW Cumulative Exisitng		**13,206**	**3,696** *	**36**	**1,329**	**22** *
## Gila River - Bitter Creek - HW Target		5,340	1,132	523	264	9
Natural Background		1,997	424	196	99	3.2
Reductions Needed		59.6%	*	**Meets**	80.1%	*
Gila,Yuma Wash - Bitter Creek Existing		N.A.	N.A.	N.A.	--	--
Gila,Yuma Wash - Bitter Creek Target		N.A.	N.A.	N.A.	--	--
Natural Background			**See natural background values called out above**			
Reductions Needed			**See cumulative reductions called for above**			

* Insufficient data: fewer than four data points in the dataset. Reductions if necessary not quantified.

All category loads and targets called out; segment listed on state's 303(d) impaired waters list for E. coli

N.A Subwatershed 90th percentile values cannot be called out independently of cumulative watershed 90th percentiles

Table 5. Reach 15040002-004 Mean Load Allocations and Summary of Reductions

Reach 15040002-004: Gila River - Bitter Creek to New Mexico State Line
TMDL calculations, Mean Values, G-org/day

Total Watershed Area, Sq Mi.	Percentage Watershed Area	**Cumulative *E. coli* Target Values**	*Category 1 High Flows*	*Category 2 Moist Conditions*	*Category 3 Mid-Range Flows*	*Category 4 Dry Conditions*	*Category 5 Low Flows*
		Reach 15040002-004					
		Geomeans (G-org/day):	2,863	N.A.	280	142	5
		Arithmetic Means (G-org/day):	**7,110**	N.A.	**380**	**2,573**	**18**
		Ratios, Log geomean to Log mean	0.897445	N.A.	0.948713	0.630872	0.526071
		Category Target Value based on Reach 15040005-022 proration		**1,447**			
		Arithmetic Means Comparison, Load Determination Methods					
3,735.49	100.000%	Reach 15040002-004 Load Allocations					
		Summations of Load Allocations, Standard mandatec	**6.246**	2,631	**334**	**2,260**	**16**
		Summation of Loads prorated from Reach 022	12,230	**1,293**	723	4,989	4,309
		Load Allocations by Subwatershed (Allocated by Arithmetic Mean Values, G-org/day)					
3,345.81	89.568%	Gila River- Headwaters to NM state line	5,502	1,120 ^	294	1,991	14
389.68	10.432%	Gila River, Bitter Creek - NM state line	641	130 ^	34	232	2
		Waste Load Allocations	0	0	0	0	0
		Margin of safety: 10%	711	145	38	257	1.8
		Cumulative Natural Background, G-org/day: (4.0%)	256	52	14	93	0.6
		TMDL, Arithmetic Means, G-org/day:	7,110 +	1,447 +^	380	2,573	18

Mean Reductions Summary Table	**Reductions Needed:**	*Category 1 High Flows*	*Category 2 Moist Conditions*	*Category 3 Mid-Range Flows*	*Category 4 Dry Conditions*	*Category 5 Low Flows*
Geometric Mn	Cumulative,	**25.7%**	*	**Meets**	**Meets**	*
Arithmetic Mn	Reach 15040002-004	**13.4%**	*	**Meets**	**Meets**	*
Arithmetic Means	Gila River- Headwaters to NM state line	**77.6%**	**Meets**	--	--	--
Subwshed Reductions	Gila River - Bitter Creek - NM state line	**16.9%**	*	--	--	--

\+ Figure reflects rounding differences from stated target value. Bolded target values above apply as the TMDL
^ Category figures drawn from more conservative Reach 022 prorations
* Insufficient data: less than four data points in the mean. Reductions if necessary not quantified.

Table 6. Reach 15040002-004 Mean Load Reduction Calculations

TMDL Cumulative Reduction Totals, Geometric Means,G-org/day		*Category 1*	*Category 2*	*Category 3 Mid-Range*	*Category 4*	*Category 5*
Cumulative E.coli Target Values		*High Flows*	*Moist Conditions*	*Flows*	*Dry Conditions*	*Low Flows*
Reach 15040002-004 Existing		**2,964**	**3,696** *	**22**	**77**	**3.8** *
Reach 15040002-004 Load Capacity		**2,549**	**526**	**256**	**142**	**4.6**
Reach 15040002-004 Target TMDL (LC-10%)		2,294	473	230	128	4.2
Reach 15040002-004 Natural Background	0.04	92	19	9	5	0.2
Reach 15040002-004 Cumulative Load Allocation		**2,202**	**454**	**221**	**122**	**4.0**
Geomean Reductions Needed		**25.7%**	*	**Meets**	**Meets**	*
TMDL Reduction Calculations, Arithmetic Means G-org/day						
Reach 15040002-004 Existing		**7,391**	**3,696** *	**27**	**986**	**13** *
Reach 15040002-004 Target TMDL		**7,110**	**1,447**	**380**	**2,573**	**18**
Reach 15040002-004 Target - 10% MOS		6399	1302	342	2316	17
Reach 15040002-004 Natural Background (composite)	0.040	256	52	14	93	0.7
Reach 15040002-004 Load Allocation		6,143	1,250	329	2,223	16
Reductions Needed		**13.4%**	*	**Meets**	**Meets**	*
Contributing watershed calculations, Arithmetic Means G-org/day						
Gila River- Headwaters to NM State Line Existing		24,533	128	–	–	–
Gila River- Headwaters to NM State Line Target		5,732	1,186	–	–	–
Gila HW-NM Natural background	0.040	229	47	–	–	–
Gila, HW-NM, Load Allocation (-NB)		5,503	1,139	–	–	–
Reductions Needed		**77.6%**	**Meets**	–	–	–
Gila River - Bitter Creek - HW Cumulative Exisitng		7,391	3,696 *	–	–	–
Gila, Bitter-NM State Line, Area weighted Coefficient		0.1043	0.1043	–	–	–
Gila, Bitter-NM State Line, Existing Prorated ++		771	386 *	–	–	–
Gila, Bitter Creek - NM State Line Target		668	138	–	–	–
Gila, Bitter Creek - NM State Line Natural Background	0.040	27	6	–	–	–
Gila River - Bitter Creek - NM State Line Load Allocation		641	132	–	–	–
Reductions Needed		**16.9%**	*	–	–	–

* Insufficient data: less than four data points in the mean. Reductions if necessary not quantified.

++ Value calculated as subwatershed area percentage multiplied by cumulative existing load

Table 7. Reach 15040002-004 Single Sample Maximum Thresholds and Load Reduction Summary

Reach 15040002-004: Gila River - Bitter Creek to New Mexico State Line
TMDL calculations, Single Sample Maximums, G-org/day

	90th percentile values	Category 1 High Flows	Category 2 Moist Conditions	Category 3 Mid-Range Flows	Category 4 Dry Conditions	Category 5 Low Flows
Cumulative	Reach 15040002-004 Single Sample Maximum Targets (G-org/day):	5,340	1,132	523	264	9
	90th percentile values by subwatershed					
	Gila River- NM State Line to Headwaters	4,466	1,069	529	345	115
	Gila River, Bitter Creek - NM State Line	**	**	**	**	**

Reductions Summary Table

	Reductions Needed:	Category 1 High Flows	Category 2 Moist Conditions	Category 3 Mid-Range Flows	Category 4 Dry Conditions	Category 5 Low Flows
Cumulative	Reach 15040002-004	**63.6%**	*	**Meets**	**82.1%**	*
	Gila River- NM state line to Headwaters	**88.0%**	**Meets**	–	**Meets**	**Meets**
##	Gila River, Bitter Creek - NM State Line	**63.6%**	*	–	**82.1%**	*

** Subwatershed 90th percentile values cannot be called out independently from cumulative watershed 90th percentile values. See cumulative target values.
Reductions for subwatershed are cumulative reductions; reductions cannot be abstracted from flow and load data.
* Insufficient data; less than four values in the dataset. Reductions not quantified.

Table 8. Reach 15040002-004 Single Sample Maximum Load Reduction Calculations

Reach 15040002-004: Gila River - Bitter Creek to New Mexico State Line
TMDL Cumulative Reductions
Single Sample Maximums,G-org/day

90th Percentile E. coli Target Values	*Category 1 High Flows*	*Category 2 Moist Conditions*	*Category 3 Mid-Range Flows*	*Category 4 Dry Conditions*	*Category 5 Low Flows*
Reach 15040002-004 Target TMDL	**5,340**	**1,132**	**523**	**264**	**8.6**
Margin of Safety	10%	10%	10%	10%	10%
Reach 15040002-004 Existing	**13,206**	**3,696** *	**36**	**1,329**	**22** *
Reach 15040002-004 Target TMDL	5,340	1,132	523	264	8.6
Reach 15040002-004 Load Allocation	**4,806**	**1,019**	**471**	**238**	**8.0**
Waste Load Allocation	0	0	0	0	0
Natural Background $	1,997	424	196	99	3.2
Reductions Needed	**63.6%**	*	**Meets**	**82.1%**	*
TMDL Reduction Calculations, 90th percentile G-org/day					
Gila River- Headwaters to NM State Line Existing	**37,081**	**302**	**--**	**72**	**1.0**
Gila, HW-NM, Target	4,466	1,069	--	345	115
Waste Load Allocation	0	0	--	0	0
Natural Background	1,670	400	--	129	43
Reductions Needed	**88.0%**	**Meets**	--	**Meets**	**Meets**
Gila River - Bitter Creek - NM State Line Existing	N.A.	N.A.	--	N.A.	N.A.
Gila River - Bitter Creek - NM Target	N.A.	N.A.	--	N.A.	N.A.
Waste Load Allocation	0	0	--	0	0
Natural Background $	**See natural background values for entire watershed listed above.**				
Reductions Needed	**See cumulative reductions above**				

N.A.- Subwatershed 90th percentile values cannot be called out independently of cumulative watershed 90th percentiles
See cumulative values listed above

* Insufficient data: less than four data points in the dataset. Reductions if necessary not quantified.

$ Natural background values are percentage extrapolations from TMDL value or subwatershed LAs and are not amenable to summation.

Table 9. CWA 303(d) Listed Reaches Compilation of E. coli reductions

Reach 15040005-022 **TMDL Reduction Assessments, Geometric Means, G-org/day**	*Category 1* *High Flows*	*Category 2* *Moist Conditions*	*Category 3* *Mid-Range Flows*	*Category 4* *Dry Conditions*	*Category 5* *Low Flows*
Reach 15040005-022 Existing	**17,771**	**542**	**24**	**35**	**7.9**
Reach 15040005-022 Target TMDL	5,393	1,113	542	327	151
Reach 15040005-022 Target - 10% MOS	4,854	1,001	488	294	136
Reach 15040005-022 Natural Background (composite)	194	40	19	12	5.4
Reach 15040005-022 Load Allocation	**4,660**	**961**	**469**	**282**	**130**
Geomean Reductions Assessment	**73.8%**	**Meets**	**Meets**	**Meets**	**Meets**
Reach 15040005-022 **TMDL Reduction Calculations, 90th Percentile E. coli Target Values**	*Category 1* *High Flows*	*Category 2* *Moist Conditions*	*Category 3* *Mid-Range Flows*	*Category 4* *Dry Conditions*	*Category 5* *Low Flows*
Reach 15040005-022 Target TMDL	10,059	2,075	1,012	609	282
Reach 15040005-022 Existing Data	**176,626**	**8,560**	**967**	**425**	**25**
Reach 15040005-022 Load Allocation	**9,053**	**1,868**	**910**	**548**	**253**
Reductions Needed	**94.9%**	**78.2%**	**5.8%**	**Meets**	**Meets**
Reach 15040002-004 **TMDL Reduction Assessments, Geometric Means, G-org/day**	*Category 1* *High Flows*	*Category 2* *Moist Conditions*	*Category 3* *Mid-Range Flows*	*Category 4* *Dry Conditions*	*Category 5* *Low Flows*
Reach 15040002-004 Existing	**2,964**	**3,696** *	**22**	**77**	**3.8** *
Reach 15040002-004 Load Capacity	2,549	526	256	142	4.6
Reach 15040002-004 Target TMDL (LC-10%)	2,294	473	230	128	4.2
Reach 15040002-004 Natural Background	92	19	9	5	0.2
Reach 15040002-004 Cumulative Load Allocation	**2,202**	**454**	**221**	**122**	**4.0**
Geomean Reductions Needed	**25.7%**	*	**Meets**	**Meets**	*
Reach 15040002-004 **TMDL Reduction Calculations, 90th Percentile E. coli Target Values**	*Category 1* *High Flows*	*Category 2* *Moist Conditions*	*Category 3* *Mid-Range Flows*	*Category 4* *Dry Conditions*	*Category 5* *Low Flows*
Reach 15040002-004 Target TMDL	5,340	1,132	523	264	8.6
Reach 15040002-004 Existing	**13,206**	**3,696** *	**36**	**1,329**	**22** *
Reach 15040002-004 Load Allocation	**4,806**	**1,019**	**471**	**238**	**8.0**
Reductions Needed	**63.6%**	*	**Meets**	**82.1%**	*

* Insufficient data: less than four data points for consideration.

SUMMARY OF COMMENTS

Three sets of written comments were received in the public comment period. Commenters included Region 9 of the U.S. EPA, Freeport McMoran Inc., and Joe Sparks, Legal Counsel for the San Carlos Apache Tribe. Below is a summary of the comments and ADEQ's responses.

I. U.S. EPA, Commenter Ms. Karin Graves

- *Applicable E. coli water standards: Please state in the numeric targets section that the numeric targets in the TMDLs are based upon the applicable E. coli standard for full-body contact (FBC).*

ADEQ has added additional language in Section 3.0 to expressly state that TMDL values are derived from the FBC portion of the *E. coli* standard.

- *2009 E. coli water quality standard change: As the standard changed during the writing of these TMDLs, the differences between the old and new standard should be clearly stated, and the old standard thus included in the numeric targets section.*

The wording of the old standard has been added to the document. Discussion of the differences between the two standards in terms of averaging periods is already present in Section 3.1.

- *Load duration curves: The description of load duration curves in the E. coli TMDLs uses the word discharge in place of flow. To remain consistent please clarify that load duration curves in the TMDLs are expressions of E. coli standard times flow and a conversion factor.*

Clarification of the terminology has been added to the TMDL in Section 3.0.

- *Calculation of load allocations: EPA is concerned about the application of the geomean and ADEQ's conversion to the arithmetic mean and the resulting load allocations as the TMDL calculations. For these TMDLs EPA defines the loading capacity as equivalent to the FBC numeric criteria, e.g., Geometric mean (minimum of 4 samples in 30 days) equals 126 cfu/100 ml.*

ADEQ has added clarifying language to Section 3.0 detailing the relationship between concentrations and loads in these TMDLs and illustrating the derivation of loads from concentrations. ADEQ also has added percent reduction calculations for all geomean categories to be presented above the arithmetic mean calculations in Tables 8 and 12 and added summaries of geomean category reductions for each reach in Tables 7 and 11. However, ADEQ cautions that these geomean percent reductions can go no further than a single cumulative load allocation target and reduction in the impaired reach while still remaining consistent with the rationale that guided the entire TMDL analysis from its inception. Geomeans are not conservative values in a mass-balance analysis, and thus further breakdowns of geomeans in a summation of subwatershed load allocations is not mathematically supportable.

In addition, the TMDLs should use a term other than "Meets" in these instances where the allocated arithmetic mean is significantly higher and/or insufficient data was used to make the determination of an arithmetic load allocation and whether or not the load is currently met.

ADEQ has removed the term "Meets" where qualified from those categories where an insufficient number of samples (less than four) exist to provide anything more than a provisional value. The term has been replaced with an asterisk referring to a footnote description in the tables.

- *New Mexico's E. coli allocation: In May 2009, EPA previously asked for explanation regarding New Mexico's higher single sample maximum (SSM) and how Arizona will enforce New Mexico's allocation. We believe New Mexico has listed Bitter Creek for sediment, but not for E. coli. EPA requests language stating the concentration based standard be met at the New Mexico border is included in the TMDLs*.

New Mexico's listed Bitter Creek is a creek in the mountains of north central New Mexico near the Colorado state line (Red River watershed: Upper Rio Grande HUC 13020101) listed for sediment. Consequently, the Bitter Creek EPA is referring to has no connection with the Bitter Creek that is mentioned in these TMDLs as the terminus of Reach 15040002-004.

Additional language has been added in Section 8.4 requesting New Mexico to adhere to Arizona's water quality standard concentrations at the state line. New Mexico water quality officials have conveyed to ADEQ that as a matter of course, they attempt to meet neighboring states' TMDL allocations, consistent with the bases these are derived from, even if those bases are more stringent than New Mexico standards require.

- *Time Frame and Future Monitoring:*
  For the E. coli TMDLs the new geometric mean standard and its associated 30 day timeframe is applicable. Describe what the recommended monitoring requirements will be, including the frequency and location of sampling. If Arizona will continue to have less than 4 samples per month along the Gila River, will a rolling geomean be used to assess impairment and monitor progress?

Additional discussion has been added regarding follow-up monitoring strategies in significantly more detail for the *E. coli* TMDLs, with recommended sites, their locations, land ownership status and recommended sampling frequencies presented. ADEQ has suggested stakeholders use the concentration-based water quality standard as the benchmark for evaluation of remediation efforts on a subwatershed scale instead of attempting to incorporate a more sophisticated load analysis.

ADEQ does not plan at this point to use rolling geomeans in attempting to evaluate the geomean portion of the standard if four samples within 30 days are not present for evaluation.

- *Section 8 - Implementation Plan: EPA suggests that a detailed and effective plan be provided in the near future, and a timeline for completing an implementation plan be included in the TMDLs. Please change the title of this section to TMDL Implementation. Also, please clarify the execution of the implementation plan by stakeholders is voluntary, not the writing of the implementation plan itself.*

The title of Section 8 has been changed as suggested for the Gila River *E. coli* TMDLs, and clarification has been added to Section 8 that the execution of the implementation plan is voluntary. ADEQ notes that Section 8 does constitute the implementation plan for the Gila documents, and additional detail has been added to all TMDLs regarding implementation and monitoring activities. Language has been added to Section 8.0 to indicate more specifically what ADEQ's approach will be in the watershed. This approach is comprised of laying out needed reductions by subwatershed and waiting for local stakeholder groups to come forward with detailed proposals for efforts specific to their subwatersheds, which ADEQ can then assist and offer more detailed direction on.

- *Inclusion of dates in the Implementation Plan Section: The dates included in the Healthy Lands initiative and the description of the Arizona Watershed Improvement Plan (WIP) appears to be outdated. We suggest adding current dates to these sections. We also suggest the addition of dates to the public participation section to clarify when meetings took place.*

Further research and inquiry has been done as to the status of Arizona's progress and/or participation in these efforts since receiving EPA's comments. The narrative has been updated to reflect this new information as of January 2011. Dates have been added to the documents as suggested.

II Freeport McMoran, Inc.

FMMI does not agree with the language on page 30 that states that "FMI's WLA is set at 0 G-org/day for both the single sample maximum and the geomean value of the E. coli standard." If any E. coli is found in the future in FMMI's stormwater discharges, even if related to natural conditions, this presumably would violate the proposed

0 G-org/day WLA for FMMI's stormwater discharges.

FMI is not considered a source of *E. coli* to the Gila River hydrologic system. ADEQ expects FMI's stormwater discharges will reflect only natural loading from its stormwater basins. Any *E. coli* found in FMI's stormwater discharges is considered attributable to natural processes within the stormwater basins and thus will be accounted for under the Eagle Creek and San Francisco subwatershed load allocations. The requirement for FMI to have a waste-load allocation has been removed from the TMDL document, as *E. coli* is not considered a constituent of concern for FMI's operations.

III Mr. Joe P. Sparks, Legal Counsel, San Carlos Apache Tribe

The Draft TMDLs for E. coli does not adequately address the actual and potential contribution of E. coli from septic tanks and septic systems (collectively, "septic systems") in the identified reaches of the Gila River.

The Draft incorrectly assumes that "septic systems are normally found where residences exist outside an incorporated area where sewer service would normally be provided." Draft at Section 4.2.5.

Certainly, as stated in Section 4.2.5 of the Draft, the location of residences "within the flood plain of a major river like the Gila River, can greatly exacerbate E. coli problems." However, the "flood plain" is not defined in the Draft.

We suggest that the contribution of E. coli to the total load of the Gila River is substantial and quantifiable.

Referring to septic systems, 4.2.5 of the Draft states in part that "[t]he number of households affected and their contribution and locations at this time are unknown." This statement cannot serve as a justification for failing to assemble accurate data concerning the location and number of residences within and outside incorporated areas which currently rely on septic systems. This data should be collected, an accurate evaluation of the present and potential discharge of E. coli to the Gila River must be made, and the Draft should be revised accordingly.

ADEQ acknowledges the correctness of the Tribe's comment about septic systems co-existing in areas where sewer systems serve the population. The language of Section 4.2.5 of the TMDL has been modified to reflect this correction.

The approach to determining potential septic system contributions being suggested by the San Carlos tribe has merit where the data is available, but this type of analysis is far better suited to small watersheds and low-order streams where comprehensive censuses can be undertaken for every residence on or near the hydrologic network. This type of census approach is not well-suited for a watershed the size of the Gila River. The data the San Carlos Tribe is suggesting for use is incomplete and at last check was not known to Greenlee County itself for inhabited areas with sufficient spatial detail and accuracy. Thus, the framework chosen for analyzing and characterizing the *E. coli* problem in the Gila River was not built around attributing load contributions to individual sources types.

Septic system loading has been identified as a possible nonpoint source in Section 4.2.5 to alert stakeholders and local government entities as to the possibilities of this type of nonpoint source pollution and to encourage investigation of this possibility on a local, scale-appropriate level. ADEQ has done this with some degree of success in the upper reaches of Tonto and Christopher Creeks near Payson and has awarded grants to several watershed groups to perform these types of surveys in their local area similar to the current Gila Watershed Partnership project.

High levels of flow reflect nonpoint source contributions from many different directions and origins, not simply septic system failures and overflows of failing septic systems on potentially inundated flood plains and terraces of the Gila River. The data does not support the contention that septic system failures play a major role in the water quality impairment of the Gila River affecting the residents of the Safford Valley and the San Carlos Reservation.

ADEQ is confident that the analysis approach employed gives the most useful and robust picture of *E. coli* loading in the watershed.

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

Name:	Doug McCarty, Project Hydrologist, TMDL Unit
Address:	Department of Environmental Quality 1110 W. Washington St. Phoenix, AZ 85007
Telephone:	(602) 771-4521
Fax:	(602) 771-4528
E-mail:	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.