PRIMACY AGENCY DATA ENTRY INSTRUCTIONS, WITH EXAMPLES, FOR STAGE 1 DISINFECTANTS AND DISINFECTION BYPRODUCTS RULE (STAGE 1 DBPR)

Office of Water (4606M)
EPA 816-R-02-012
www.epa.gov/safewater
January 2003

Printed on Recycled Paper

This document does not substitute for EPA regulation nor is this document regulation itself. Thus, it cannot impose legally-binding requirements on EPA, States (Primacy Agencies), or the regulated community, and its examples may not apply to a particular situation based upon the particular circumstances.

This page intentionally left blank

Table of Contents

List of Tables iii

List of Exhibits v

List of Examples vii

Acronyms & Abbreviations ix

Section 1 Introduction

Introduction 1

1.1 What is the purpose of this Guidance Document? 1

1.2 How is this document organized? 1

1.3 What is the benefit of the Stage 1 DBPR? 1

1.4 What is the general applicability of the Stage 1 DBPR? 2

1.5 What is SDWIS and how does it work? 2

1.6 How is this document used? 3

Section 2 Violation Reporting

Violation Reporting 1

2.1 MCL Violations 16

2.1.1 Type 02/1009: Chlorite MCL Violation 18

2.1.2 Type 02/1011: Bromate MCL Violation 26

2.1.3 Type 02/2456: HAA5 (Five Haloacetic Acids) MCL Violation 39

2.1.4 Type 02/2950: TTHM (Total Trihalomethanes) MCL Violation 46

2.2 MRDL Violations 50

2.2.1 Type 11/0999: Chlorine MRDL Violation 52

2.2.2 Type 11/1006: Chloramines MRDL Violation 58

2.2.3 Type 11/1008: Chlorine Dioxide MRDL Violation 63

2.3 Treatment Technique Violations 69

2.3.1 Type 12/0400: Qualified Operator in Charge 69

2.3.2 Type 37/0400: Unapproved Treatment Modifications TT Violation . . 71

2.3.3 Type 46/2920: DBP Precursors Removal TT Violation 73

2.4 Monitoring & Reporting Violations 80

2.4.1 Type 27/0400: Monitoring Plan Development and Submittal M&R Violation 80

2.4.1.1 Failure to Develop Monitoring Plan within 30 days of Compliance Date M&R Violation 81

2.4.1.2 Failure to Submit Monitoring Plan to Primacy Agency M&R Violation 83

2.4.2 Type 27/0999: Chlorine Monitoring and Reporting Violation 86

2.4.3 Type 27/1011: Bromate M&R Violation 91
2.4.4 Type 27/1006: Chloramines M&R Violation 96
2.4.5 Type 27/1009: Chlorite M&R Violation 100
2.4.6 Type 27/1008: Chlorine Dioxide M&R Violation 105
2.4.7 Type 27/2456: HAA5 M&R Violation and Type 27/2950: TTHM M&R Violation 109
2.4.7.1 Subpart H at Least 10,000 People 109
2.4.7.2 Subpart H 500 to 9,999 People 114
2.4.7.3 Subpart H <500 People 117
2.4.7.4 GW at least 10,000 People 117
2.4.7.5 GW < 10,000 People 117
2.4.8 Type 27/2920: Source and Finished Water TOC / Source Water Monitoring Alkalinity 118

Section 3 General SDWIS Reporting
General SDWIS Reporting 1
3.1 Federally Reported Violations 1

Section 4 Additional Sources of Information
Additional Sources for Technical Information on the Stage 1 DBPR 1

List of Tables

Table 1-1. Regulated Contaminants/Disinfectants 1-2
Table 2.1a. Summary of Stage 1 DBPR Violations 2-2
Table 2.1b: Reporting Fields for Stage 1 DBPR Violations 2-9
Table 2-2. SDWIS/FED Codes for MCL Reporting Under the Stage 1 DBPR 2-17
Table 2-3. Chlorite MCL Violations 2-18
Table 2-4. System A Monitoring Summary 2-19
Table 2-5. System A March 2002 Chlorite Monitoring Results 2-20
Table 2-6. Chlorite Reporting Requirement [40 CFR 141.134] 2-21
Table 2-7. System A April 2002 Chlorite Monitoring Results 2-22
Table 2-8. System A August 2002 Chlorite Monitoring Results 2-24
Table 2-9. System A September 2002 Chlorite Monitoring Results 2-25
Table 2-10. Bromate MCL Violation 2-26
Table 2-11a. System B (Source # 1) Monitoring Summary 2-28
Table 2-11b. System B (Source # 2) Monitoring Summary 2-29
Table 2-12. System B 1st Quarter 2004 Bromate Monitoring Results 2-30
Table 2-13. Bromate Reporting Requirement [40 CFR 141.134] 2-30
Table 2-14. System B 2nd Quarter 2004 Bromate Monitoring Results 2-31
Table 2-15. System B 4th Quarter 2004 Bromate Monitoring Results 2-33
Table 2-16. System B RAA Bromate Monitoring Results 2-35
Table 2-17. System B June 2005 RAA Bromate Monitoring Results 2-36
Table 2-18. System B 2006 RAA Bromate Monitoring Results 2-38
Table 2-19. HAA5 MCL Violation 2-39
Table 2-20. System C Monitoring Summary 2-40
Table 2-21. System C 1st Quarter 2002 HAA5 Monitoring Results 2-41
Table 2-22. TTHM and HAA5 Reporting Requirement [40 CFR 141.134] 2-41
Table 2-23. System C 2002 HAA5 Monitoring Results 2-42
Table 2-24. System C 2nd Quarter 2003 HAA5 Monitoring Results 2-44
Table 2-25. System C 2nd Quarter 2003 HAA5 RAA Monitoring Results 2-45
Table 2-26. TTHM MCL Violation 2-46
Table 2-27. System D Monitoring Summary 2-47
Table 2-28. System D 1st Quarter 2004 TTHM Monitoring Results 2-48
Table 2-29. System D 2004 TTHM Monitoring Results 2-49
Table 2-30. Regulated Disinfectant MRDLs 2-50
Table 2-31. SDWIS/FED Codes for MRDL Reporting Under the Stage 1 DBPR 2-52
Table 2-32. Chlorine MRDL Violation 2-52
Table 2-33. System E Monitoring Summary 2-53
Table 2-34. System E 1st Quarter 2004 Chlorine Residual Monitoring Results 2-54
Table 2-35. Chlorine or Chloramines Reporting Requirement [40 CFR 141.134] 2-54
Table 2-36. System E 3rd Quarter 2004 Chlorine Residual Monitoring Results 2-55
Table 2-37. System E 4th Quarter 2004 Chlorine Residual Results 2-56
Table 2-38. Chloramines MRDL Violation 2-58
Table 2-39. System F Monitoring Summary 2-59
Table 2-40. System F 2002 Chloramine Monitoring Results 2-60

Table 2-41. System F Chloramine Monitoring RAA Results 2-61
Table 2-42. Chlorine Dioxide MRDL Violations 2-63
Table 2-43. System AA Chlorine Dioxide Monitoring Summary 2-64
Table 2-44. System AA January 2002 Chlorine Dioxide Monitoring Results (mg/L) 2-66
Table 2-45. Chlorine Dioxide Reporting Requirement [40 CFR 141.134] 2-67
Table 2-46. SDWIS/FED Codes for TT Reporting Under the Stage 1 DBPR 2-69
Table 2-47. Qualified Operator TT Violation 2-69
Table 2-48. DBPP Removal Treatment Technique Violation 2-73
Table 2-49. System DD's Monitoring Summary 2-75
Table 2-50. Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Subpart H Systems Using Conventional Treatment 2-76
Table 2-51. System DD 2001 Source and Treated Water TOC Monitoring Results 2-76
Table 2-52. System DD 2002 Source and Treated Water TOC Monitoring Results 2-78
Table 2-53. System DD DBPR Removal (TT) Reporting Requirements [40 CFR 141.134] 2-79
Table 2-54. SDWIS/FED Codes for Federal Reporting Under the Stage 1 DBPR 2-80
Table 2-55. Monitoring Plan Monitoring and Reporting Violation 2-81
Table 2-56. System EE Monitoring Summary 2-82
Table 2-57. Monitoring Plan - Monitoring and Reporting Violation 2-83
Table 2-58. System FF Monitoring Summary 2-84
Table 2-59. Chlorine Monitoring and Reporting Violation 2-86
Table 2-60. System G Monitoring Summary 2-87
Table 2-61. Bromate Monitoring and Reporting Violation 2-91
Table 2-62. System H Monitoring Summary 2-92
Table 2-63. System H 2004 Treated Water Bromate and Source Water Bromide Monitoring Results (mg/L) 2-93
Table 2-64. System H 2005 Treated Water Bromate and Source Water Bromide Monitoring Results (mg/L) 2-95
Table 2-65. Chloramines Monitoring and Reporting Violation 2-96
Table 2-66. System J Monitoring Summary 2-97
Table 2-67. System J 2004 Chloramine Monitoring Results - mg/L as Cl_2 2-97
Table 2-68. System J 2005 Chloramine Monitoring Results - mg/L as Cl_2 2-98
Table 2-69. Chlorite Monitoring and Reporting Violation 2-100
Table 2-70. System GG Monitoring Summary 2-102
Table 2-71. System GG January 2002 Chlorite Monitoring Results (mg/L) 2-103
Table 2-72. Chlorine Dioxide Monitoring and Reporting Violation 2-105
Table 2-73. System HH Monitoring Summary 2-106
Table 2-74. March 2004 Chlorine Dioxide Monitoring Results mg/L as ClO_2 2-107
Table 2-75. HAA5 Monitoring and Reporting Violation 2-109
Table 2-76. TTHM Monitoring and Reporting Violation 2-109
Table 2-77. System JJ Monitoring Summary 2-110
Table 2-78. System JJ 2002 TTHM & HAA5 Monitoring Results (mg/L) 2-112
Table 2-79. System JJ 2003 TTHM & HAA5 Monitoring Results (mg/L) 2-112
Table 2-80. System KK 2004 HAA5 and TTHM Monitoring Results (mg/L) 2-115
Table 2-81. Paired TOC and Alkalinity Monitoring and Reporting Violation 2-118
Table 2-82. System QQ 2002 TOC and Alkalinity (mg/L) 2-119

List of Exhibits

Exhibit 2.1 Chlorite MCL Violation Data Element Table and DTF Transactions 2-23
Exhibit 2.2 Chlorite MCL Violation Data Element Table and DTF Transactions 2-25
Exhibit 2.3 Bromate MCL Violation Data Element Table and DTF Transactions 2-32
Exhibit 2.4 Bromate MCL Violation Data Element Table and DTF Transactions 2-34
Exhibit 2.5 Bromate MCL Violation Data Element Table and DTF Transactions 2-37
Exhibit 2.6 HAA5 MCL Violation Data Element Table and DTF Transactions 2-43
Exhibit 2.7 TTHM MCL Violation Data Element Table and DTF Transactions 2-50
Exhibit 2.8 Chlorine MRDL Violation Data Element Table and DTF Transactions 2-57
Exhibit 2.9 Chloramine MRDL Violation Data Element Table and DTF Transactions 2-62
Exhibit 2.10 Chlorine Dioxide Acute and Non-Acute MRDL Violation Data Element Table and DTF Transactions 2-68
Exhibit 2.11 Qualified Operator TT Violation Data Element Table and DTF Transactions 2-71
Exhibit 2.12 Significant Treatment Plant Modification TT Violation Data Element Table and DTF Transactions 2-73
Exhibit 2.13 Monitoring Plan Monitoring and Reporting Violation and RTC Data Element Table and DTF Transactions 2-85
Exhibit 2.14 Chlorine Major Monitoring Violation Data Element Table and DTF Transactions 2-88
Exhibit 2.15 Chlorine Minor Monitoring Violation Data Element Table and DTF Transactions 2-90
Exhibit 2.16 Bromate Major Monitoring and Reporting Violation Data Element Table and DTF Transactions 2-94
Exhibit 2.17 Chloramines Minor Monitoring Violation Data Element Table and DTF Transactions 2-100
Exhibit 2.18 Chlorite M&R Violation Data Element Table and Individual DTF Transactions 2-104
Exhibit 2.19 Chlorine Dioxide M&R Violation Data Element Table and Individual DTF Transactions 2-108
Exhibit 2.20 TTHM and HAA5 M&R Violations Data Element Table and Individual DTF Transactions 2-116
Exhibit 2.21 TOC/Alkalinity M&R Violations Data Element Table and Individual DTF Transactions 2-120
Exhibit 3.1 DTF and Transaction Format 3-2

This page intentionally left blank

List of Examples

Example System Description - System A 2-18
Example #1 - No Chlorite MCL Violation with Single Sample >1.0 mg/L 2-20
Example #2 - One Chlorite MCL Violation in a Month 2-21
Example #3 - Multiple Chlorite MCL Violations in a Month 2-23
Example #4 - Routine Daily Monitoring and Routine 3-Sample Set 2-25
Example System Description - System B 2-26
Example #5 - Calculating Bromate Compliance for 1st Quarter During 1st Year of Monitoring 2-29
Example #6 - Calculating Bromate Compliance for 2nd Quarter During 1st Year of Monitoring 2-31
Example #7 - Calculating Bromate Compliance Based on a Complete Year of Data 2-32
Example #8 - Calculating RAA for Bromate 2-34
Example #9 - Bromate MCL Exceedance 2-36
Example #10 - CWS Fails to Collect Several Required Bromate Samples 2-37
Example System Description - System C 2-39
Example #11 - HAA5 MCL RAA Calculating After 1st Quarter 2-40
Example #12 - HAA5 Compliance Calculation During 1st Year of Monitoring 2-42
Example #13 - HAA5 MCL Full Year RAA Calculation 2-43
Example# 14 - HAA5 Missing Samples 2-44
Example System Description - System D 2-46
Example #15 - TTHM MCL 1st Quarter of Data 2-47
Example #16 - TTHM MCL 3rd Quarter RAA 2-48
Example System Description - System E 2-52
Example #17 - Chlorine MRDL 1st Quarter RAA 2-53
Example #18 - Chlorine MRDL 3rd Quarter 2-55
Example #19 - Chlorine MRDL Full Year RAA 2-56
Example System Description - System F 2-58
Example #20 - Chloramines MRDL Full Year RAA in Compliance 2-59
Example #21 - Chloramines MRDL Full Year RAA in Violation 2-61
Example System Description - System AA 2-63
Example #22 - Chlorine Dioxide MRDL Acute and Non-Acute Violation 2-65
Example System Description - System BB 2-69
Example #23 - Qualified Operator (TT) 2-70
Example System Description - System CC 2-72
Example #24 - Significant Treatment Process Modification Plan (TT) 2-72
Example System Description - System DD 2-74
Example #25 - TT (DBPP Reduction) System Meets Alternative Compliance Criteria 2-76
Example #26 - TT (DBPP Reduction) Failure to Meet Alternative Compliance Criteria 2-77
Example System Description - System EE 2-81
Example #27 - M&R Monitoring Plan Compliance by System 2-81

Example System Description - System FF 2-83
Example #28 - Failure to Submit a Monitoring Plan 2-83
Example System Description - System G 2-86
Example #29 - M&R for Chlorine Major Violation 2-87
Example #30 - M&R for Chlorine Minor Violation 2-88
Example #31 - M&R for Chlorine 2-90
Example System Description - System H 2-91
Example #32 - M&R for Bromate Major Violation 2-93
Example #33 - M&R for Bromate Major Violation Spanning Two Calendar Years 2-95
Example System Description - System J 2-96
Example #34 - M&R for Chloramines Compliance Over 12 Months 2-97
Example #35 - M&R for Chloramines 2-98
Example System Description - System GG 2-101
Example #36 - M&R for Chlorite 2-101
Example System Description - System HH 2-105
Example #37 - M&R for Chlorine Dioxide 2-106
Example System Description - System JJ 2-109
Example #38 - M&R TTHM and HAA5 Calendar Year 2002 2-110
Example #39 - M&R for HAA5 & TTHM 2002 / 2003 2-111
Example #40 - M&R for HAA5 & TTHM Calendar Year 2003 2-113
Example System Description - System KK 2-114
Example #41 - M&R for HAA5 and TTHM Small System Quarterly 2-114
Example System Description - System QQ 2-118
Example #42 - M&R Paired TOC/Finished Alkalinity 2-118

Acronyms & Abbreviations

ACR:	Annual Compliance Report
CCR:	Consumer Confidence Report
CFR:	Code of Federal Regulations
CWS:	Community Water System
DBP:	Disinfection Byproducts
DBPP:	Disinfection Byproducts Precursors
DTF:	Data Transfer File
EPA:	Environmental Protection Agency
GWUDI:	Ground Water Under the Direct Influence of Surface Water
HAA5:	Haloacetic Acids (five) (chloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid and dibromoacetic acid)
IESWTR:	Interim Enhanced Surface Water Treatment Rule
Log:	Logarithm (common, base 10)
MCL:	Maximum Contaminant Level
MCLG:	Maximum Contaminant Level Goal
MDBP:	Microbial and Disinfectants/Disinfection Byproducts
mg/L:	Milligrams per Liter
M&R:	Monitoring and Reporting
MRDL:	Maximum Residual Disinfectant Level
MRDLG:	Maximum Residual Disinfectant Level Goal
NTNCWS:	Non-Transient Non-Community Water System
PWS:	Public Water System
RAA:	Running Annual Average
RTC:	Return to Compliance
SDWA:	Safe Drinking Water Act, or the ''Act,'' as amended 1996
SDWIS:	Safe Drinking Water Information System
Stage 1 DBPR	Stage 1 Disinfection and Disinfection Byproducts Rule
Subpart H system:	PWS using surface water or ground water under the direct influence of surface water
SUVA:	Specific Ultraviolet Absorbance
SWTR:	Surface Water Treatment Rule
TOC:	Total Organic Carbon
TT:	Treatment Technique
TTHM:	Total Trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform)
USEPA:	United States Environmental Protection Agency
x log removal:	Reduction to $1/10^x$ of original concentration

This page intentionally left blank

Section 1

Introduction

This page intentionally left blank

Introduction

1.1 *What is the purpose of this Guidance Document?*

On December 16, 1998, the US Environmental Protection Agency (USEPA) published in the *Federal Register* the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR). This document is intended to provide guidance to Primacy Agencies regarding the monitoring and reporting requirements of the Stage 1 DBPR. It discusses through the use of typical water system examples, the water system monitoring and reporting requirements, compliance and recordkeeping calculations, systems' non-compliance information reporting responsibilities, and the Primacy Agency's reporting responsibilities to EPA's database, the Safe Drinking Water Information System Federal (SDWIS/FED). Using this reference, Primacy Agencies will be able to identify violations and report appropriate noncompliance information to EPA. Throughout this document, the term Primacy Agency will be used to refer to a State, Tribal Government, or EPA Region with primary enforcement authority for the SDWA.

1.2 *How is this document organized?*

The document includes an Introduction Section 1 and three additional Sections as follows: Section 2 discusses violation determinations and when, where and what to report; Section 3 provides basic SDWIS/FED reporting information regarding the Stage 1 DBPR, and Section 4 describes additional sources of information regarding the Stage 1 DBPR. Section 2 is divided into subsections that discuss Maximum Contaminant Level (MCL) and Maximum Residual Disinfectant Level (MRDL) violations, Treatment Technique (TT) violations, Monitoring and Reporting (M&R) violations and recordkeeping violations. Each violation type uses example facility descriptions and the appropriate SDWIS/FED violation type codes to illustrate the typical violations that may be encountered during the routine operation of water systems. Example DTF (data transfer file) transactions that Primacy Agencies would report to EPA, representing the information or violations, are also included.

1.3 *What is the benefit of the Stage 1 DBPR?*

The Stage 1 DBPR is part of a series of rules, the "Microbial and Disinfection Byproducts Cluster" (MDBP Cluster), that are intended to control microbial pathogens while minimizing the public health risks from disinfectants and disinfection byproducts (DBPs). The Stage 1 DBPR specifically addresses risks associated with disinfectants and DBPs. This rule was published concurrently with the Interim Enhanced Surface Water Treatment Rule (IESWTR), which addresses control of microbial pathogens in Subpart H systems.

The Stage 1 DBPR applies to all community water systems and nontransient noncommunity water systems that add a chemical disinfectant during any part of the treatment process. The Stage 1 DBPR updates and supersedes the 1979 total trihalomethanes (TTHM) standard by lowering the MCL for TTHM, establishing new MCLs for chlorite, bromate, and haloacetic acids (HAA5), and establishing MRDLs for chlorine, chloramines, and chlorine dioxide (see Table 1-1). In addition, the Stage 1 DBPR requires systems using conventional filtration to comply with a treatment technique requirement for DBP precursor removal and imposes certain requirements upon transient non-community water systems that use chlorine dioxide.

The following table presents the Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfection Levels (MRDLs) prescribed by the rule.

Table 1-1. Regulated Contaminants/Disinfectants			
Regulated Contaminants	**MCL (mg/L)**	**Regulated Disinfectants**	**MRDL (mg/L)**
Total Trihalomethanes (TTHM)	0.080		
Chloroform Bromodichloromethane Dibromochloromethane Bromoform		**Chlorine**	4.0 as Cl_2
Five Haloacetic Acids (HAA5)	0.060	**Chloramines**	4.0 as Cl_2
Monochloroacetic Acid Dichloroacetic Acid Trichloroacetic Acid Bromoacetic Acid Dibromoacetic Acid		**Chlorine Dioxide**	0.8
Bromate (plants that use ozone)	0.010		
Chlorite (plants that use chlorine dioxide)	1.0		

mg/L = milligrams/Liter

For more information on the Stage 1 DBPR requirements please call the Safe Drinking Water Hotline (1-800-426-4791) or visit the EPA website at www.epa.gov/safewater.

1.4 *What is the general applicability of the Stage 1 DBPR?*

The 1979 TTHM requirements applied only to community water systems serving 10,000 or more people. Under the Stage 1 DBPR, systems that use surface water or ground water under the direct influence of surface water (GWUDI) as a source (also referred to as Subpart H systems) serving 10,000 or more people had to comply with the requirements of the Stage 1 DBPR beginning January 1, 2002. Primacy Agencies can grant up to 24 additional months for capital improvements for Subpart H systems serving 10,000 or more people. This extension delays the compliance date for meeting the MCL, but the system must monitor as required by the rule and report the results of any detected Stage 1 DBPR contaminants in their Consumer Confidence Report (CCR). Since the system would not be in violation of the MCL, public notification would not be required. Additionally, Subpart H systems that serve fewer than 10,000 people, and all affected ground water systems, must comply with the requirements beginning January 1, 2004.

1.5 *What is SDWIS and how does it work?*

SDWIS/FED (Safe Drinking Water Information System/Federal version) is EPA's national database that stores routine information about the Nation's drinking water.

Primacy Agencies supervise the drinking water systems within their jurisdictions to implement and enforce the Safe Drinking Water Act (SDWA). The SDWA requires that Primacy Agencies report drinking water information periodically to EPA; this information is maintained in SDWIS/FED.

Primacy Agencies report the following information to EPA:

1. Basic information on each water system, including: name, PWS-ID number, number of people served, type of system (year-round or seasonal), source of water (ground water or surface water), and a description of the treatment processes.

2. Violation information for each water system: whether it has followed established monitoring and reporting schedules, complied with mandated treatment techniques, or violated any MCLs.

3. Enforcement information: what actions Primacy Agencies have taken to ensure that drinking water systems return to compliance if they are in violation of a drinking water regulation.

4. Monitoring results for unregulated contaminants and for regulated contaminants in certain instances when the monitoring results exceed the MCL.

EPA uses this information to determine if and when it needs to take action against non-compliant systems, oversee Primacy Agency drinking water programs, track contaminant levels, respond to public inquiries, and prepare national reports. EPA also uses this information to evaluate the effectiveness of its programs and regulations, and to determine whether new regulations are needed to further protect public health. A subset of the data is posted to EPA's Envirofacts web page for public access.

1.6 *How is this document used?*

Primacy Agency personnel should evaluate each system for its need to comply with the provisions of the Stage 1 DBPR. For those systems required to comply with the Stage 1 DBPR, this document evaluates compliance for each rule requirement (i.e.; required system monitoring, system reporting to the Primacy Agency, system public notice, and reporting by the Primacy Agency to SDWIS/FED). The descriptions of the example systems in this document include example monitoring data and the calculations and data comparisons necessary to determine compliance with the requirements of the Stage 1 DBPR. Example SDWIS/FED data transfer file (DTF) tables show how the data describing violations of the Stage 1 DBPR are to be encoded to be entered into the SDWIS/FED system. In addition, the examples provide guidance regarding public notification requirements consistent with EPA's Public Notification (PN) Rule. This guidance document does not offer any examples of SDWIS/FED reporting requirements associated with water system violations of the PN Rule. Users should refer to the "Final State Implementation Guidance for the Public Notification Rule" for additional information on these requirements and reporting to Primacy Agencies and EPA.

This page intentionally left blank

Section 2

Violation Reporting

This page intentionally left blank

Violation Reporting

Violations of the Stage 1 DBPR include maximum contaminant level (MCL) violations, maximum residual disinfectant level (MRDL) violations, treatment technique (TT) violations, and monitoring and reporting (M&R) violations. The rule requires sample collection, analysis, reporting, and record keeping for compliance with four MCLs (chlorite, bromate, TTHM and HAA5), and three MRDLs (chlorine, chlorine dioxide, and chloramines). Three expressions of TT violations and ten different expressions of M&R violations are also defined. The violations are summarized in Table 2-1a, "Summary of Stage 1 DBPR Violations." Table 2.1b, "Reporting Fields for Stage 1 DBPR," provides guidance about the violation fields that need to be reported for each of the violations. Additional detailed transaction coding instructions are contained in the "SDWIS/FED Data Entry Instructions."

Table 2.1a. Summary of Stage 1 DBPR Violations

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 02/1009 For all systems using chlorine dioxide for disinfection or oxidation, if the average of any three-sample set exceeds the **chlorite** MCL of 1.0 mg/L.	Report violations on a monthly basis, with severity indicated by the number of exceedances.	N/A	MCL	Will require a new numeric field (C1112) in which to record the number of times the MCL was exceeded during the month. EPA will use this number to represent the actual number of violations incurred by the water system, for Annual Compliance Report (ACR) and other statistical purposes.
Type 02/1011 For all systems using ozone for disinfection or oxidation, if the running annual average computed quarterly of available monthly samples, exceeds the **bromate** MCL of 0.010 mg/L.	Quarterly violations of quarterly duration.	N/A	MCL	Record the begin and end dates of the violation to be the quarter in which the monthly samples create an annual average exceeding the standard. If the water system misses one or more monthly samples, it uses only the values available to compute compliance. No need to report analytic result as part of the violation.
Type 02/2456 For all systems, if the running annual average computed quarterly of available monthly samples (quarterly averages) exceeds 0.060 mg/L for **HAA5**.	Quarterly violations of quarterly duration.	N/A	MCL	Record the begin and end dates of the violation to be the quarter in which the monthly samples create an annual average exceeding the standard. If the water system misses one or more monthly samples, it uses only the values available to compute compliance. No need to report analytic result as part of the violation.
Type 02/2950 For all systems, if the running annual average computed quarterly of available monthly samples (quarterly averages) exceeds 0.080 mg/L for **TTHM**.	Quarterly violations of quarterly duration.	N/A	MCL	Record the begin and end dates of the violation to be the quarter in which the monthly samples create an annual average exceeding the standard. If the water system misses one or more monthly samples, it uses only the values available to compute compliance. No need to report analytic result as part of the violation.

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 11, 13/1008 For all systems using chorine dioxide for disinfection or oxidation. ACUTE (type 13): If any of the three required **chlorine dioxide** distribution samples taken on the day following a daily entry point sample MRDL exceedance of 0.8 mg/L also exceed the MRDL; or, failure to collect and report additional **chlorine dioxide** samples (in the distribution system) on the day following an MRDL exceedance. This is specified in the rule as a MRDL violation. NON-ACUTE (type 11): If any two consecutive daily entry point samples exceed 0.8 mg/L and all distribution samples are less then 0.8 mg/L; or failure to collect and report additional **chlorine dioxide** samples (at the entry point) on the day following an MRDL exceedance at the entrance to the distribution system is also specified in the rule as an MRDL violation.	Report violations on a monthly basis, with severity indicated by the number of exceedances that occurred during that month.	N/A	MRDL	Will require a new numeric field (C1112) in which to record the number of times the MRDL was exceeded during the month. EPA will use this number to represent the actual number of violations incurred by the water system, for ACR and other statistical purposes. Water systems can incur acute and nonacute violations, and have them recorded in SDWIS/FED during the same month.

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 11/1006 For all systems using chloramines, if the running annual average, computed quarterly, of monthly averages of available data exceeds 4.0 mg/L of **chloramines** (unless increased residual levels in the distribution system address specific microbial contamination problems).	Quarterly violations of quarterly duration.	N/A	MRDL	Record the begin and end dates of the violation to be the quarter in which the monthly samples create an annual average exceeding the standard. If the water system misses one or more monthly samples, it uses only the values available to compute compliance. No need to report analytic result as part of the violation.
Type 11/0999 For all systems using chorine, if the running annual average, computed quarterly, of monthly averages of available data exceeds 4.0 mg/L of **chlorine** (unless increased residual levels in the distribution system address specific microbial contamination problems).	Quarterly violations of quarterly duration.	N/A	MRDL	Record the begin and end dates of the violation to be the quarter in which the monthly samples create an annual average exceeding the standard. If the water system misses one or more monthly samples, it uses only the values available to compute compliance. No need to report analytic result as part of the violation.
Type 12/0400 Failure to have a State-approved and listed qualified operator running the plant.	Begins: When State learns that the facility does not have a qualified operator. Ends: When the State is satisfied that the plant has a qualified operator.	N/A	TT	Have a future end date = 12/31/2015, with the end date modified as a result of a link to an RTC, to be reported

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 27/1008 Failure to collect and report 100% of required **chlorine dioxide** samples.	Violations reported monthly with severity indicated by the number of days not sampled or not reported. All such violations are considered major.	major	M&R	Will require a new numeric field (C1112) in which to record the number of days samples were not taken or reported during the month. EPA will use this number to represent the actual number of violations incurred by the water system, for ACR and other statistical purposes.
Type 27/1009 MAJOR: Failure to collect and report at least 90% of daily **chlorite** samples at the entrance to the distribution system or any required three-set **chlorite** sample in the distribution system. MINOR: Collecting and reporting 90-99% of daily **chlorite** samples.	Violations reported monthly at the system level.	either	M&R	The major/minor is computed based upon ALL the samples that are required, for the entire water system
Type 27/0400 Failure to develop, within 30 days of the initial compliance dates, and monitor in accordance with the monitoring plan.	Begins: 30 days after the initial compliance date (either January 31, 2002 for large Subpart H systems or January 31, 2004 for small Subpart H systems). Ends: When State is satisfied that plan has been developed (date of report, if available).	major	M&R	Have a future end date (such as 12/31/2015) with the end date modified as a result of a link to an RTC, to be reported.

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 27/0400 Failure to submit a copy of the monitoring plan to the State no later than the date of the first report required under §141.134. (Only Subpart H systems > 3,300 population must submit plan to state, all must develop one)	Begins: 10 days after report to be completed (either April 10, 2002 for large Subpart H systems or April 10, 2004 for small Subpart H systems). Ends: When report is submitted to the State, if required.	major	M&R	Have a future end date (such as 12/31/2015) with the end date modified as a result of a link to an RTC, to be reported.
Type 27/1006 MAJOR: Failure to collect and report at least 90% of **chloramine** samples. MINOR: Collecting and reporting 90-99% of **chloramine** samples.	Begins: First day of the quarter in which one or more samples are missed Ends: Last day of the quarter in which one or more samples are missed	either	M&R	
Types 27/1011 Failure to collect and report 100% of required **bromate** samples (1/plant/month for routine and 1/plant/quarter for reduced)	Begins: First day of the quarter in which one or more samples are missed Ends: Last day of the quarter in which one or more samples are missed	major	M&R	Note: There is no violation for a water systems' failure to take bromide samples. This failure could result in the water system having to return to a routine bromate monitoring schedule.

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 27/0999 MAJOR: Failure to collect and report at least 90% of **chlorine** samples. MINOR: Collecting and reporting 90-99% of **chlorine** samples.	Begins: First day of the quarter in which one or more samples are missed Ends: Last day of the quarter in which one or more samples are missed	either	M&R	
Type 27/2920 Failure to collect source and finished water TOC samples and alkalinity sample (1pair/plant/month routine or 1pair/plant/quarter reduced.	Begins: First day of the quarter in which one or more samples are missed Ends: Last day of the quarter in which one or more samples are missed	major	M&R	
Types 27/2456 and 27/2950 MAJOR: Failure to collect and report at least 90% of required **TTHM** and **HAA5** samples. MINOR: Collecting and reporting 90-99% of required TTHM and HAA5 samples.	Begins: First day of the quarter (or annual or triennial period begin date) in which one or more samples are missed Ends: Last day of the quarter (or annual or triennial period begin date) in which one or more samples are missed	either	M&R	For systems on annual and triennial periods, use the begin date and end date of those periods.

VIOLATION DEFINITION	DESCRIPTION	MAJOR MINOR[1]	VIOLATION TYPE[2]	DETAILS
Type 37/0400 Failure to submit and obtain State approval of a plan detailing significant treatment process modifications prior to making such modifications.	Begins: Either date when modification is begun or when the State becomes aware of the modification. Ends: When State notifies the facility that it approves of the modification.	Major	M&R	Have a future end date (such as 12/31/2015) with the end date modified as a result of a link to an RTC, to be reported.
Type 46/2920 Failure to meet the Treatment Technique requirements for DBP Precursor removal.	Begins: Beginning of quarter in which sampling is conducted. Ends: End of quarter in which sampling is conducted.	N/A	TT	Quarterly compliance period

[1] column identifies the violation as being "major", either major or minor based upon noncompliance circumstances ("either"), or not applicable to the violation ("N/A")
[2] column identifies the type of violation: MCL = maximum contaminant level; MRDL = Maximum Residual Disinfectant Level; M&R = monitoring and reporting

Violation reporting fields

Only the fields identified below in Table 2.1b, "Reporting Fields for Stage 1 DBPR Violations," are to be reported to represent Stage 1 DBPR violations. Data Transfer File (DTF) capabilities such as qualifiers 1 and 2 (PWS ID and Violation ID, respectively) continue to be required. Batch Sequence number continues to be optional. All other violation fields should NOT be included in submissions to EPA. Those fields, if included in a submission, will be rejected.

Table 2.1b: Reporting Fields for Stage 1 DBPR Violations

Violation	Type	Contaminant Code (C1103)	Type Code (C1105)	Compliance Period Begin Date (C1107)	Compliance Period End Date (C1109)	Severity Indicator count (C1112)[1]	Major Violation Indicator (C1131)
Chlorite	MCL	1009	02	first day of month	last day of month	yes	do not report
Chlorite	M&R	1009	27	first day of month	last day of month	do not report	yes= failure to collect at least 90% of daily chlorite samples or any required 3 sample set in the distribution system no=failure to collect/report 90%-99% of daily chlorite samples
Bromate	MCL	1011	02	first day of quarter	last day of quarter	do not report	do not report

Violation	Type	Contaminant Code (C1103)	Type Code (C1105)	Compliance Period Begin Date (C1107)	Compliance Period End Date (C1109)	Severity Indicator count (C1112)[1]	Major Violation Indicator (C1131)
Bromate	M&R	1011	27	first day of quarter	last day of quarter	do not report	yes= failure to collect at least 90% of required samples no=failure to collect/report 90%-99% of samples
HAA5	MCL	2456	02	first day of quarter	last day of quarter	do not report	do not report
HAA5	M&R	2456	27	first day of quarter	last day of quarter	do not report	yes= failure to collect at least 90% of required samples no=failure to collect/report 90%-99% of samples
TTHM	MCL	2950	02	first day of quarter	last day of quarter	do not report	do not report
TTHM	M&R	2950	27	first day of quarter	last day of quarter	do not report	yes= failure to collect at least 90% of required samples no=failure to collect/report 90%-99% of samples
Acute Chlorine Dioxide	MRDL	1008	13	first day of month	last day of month	yes	do not report

Violation	Type	Contaminant Code (C1103)	Type Code (C1105)	Compliance Period Begin Date (C1107)	Compliance Period End Date (C1109)	Severity Indicator count (C1112)[1]	Major Violation Indicator (C1131)
Nonacute Chlorine Dioxide	MRDL	1008	11	first day of month	last day of month	yes	do not report
Chlorine Dioxide	M&R	1008	27	first day of month	last day of month	yes	always major
Chloramine	MRDL	1006	11	first day of quarter	last day of quarter	do not report	do not report
Chloramine	M&R	1006	27	first day of quarter	last day of quarter	do not report	yes= failure to collect at least 90% of required samples no=failure to collect/report 90%-99% of samples
Chlorine	MRDL	0999	11	first day of quarter	last day of quarter	do not report	do not report
Chlorine	M&R	0999	27	first day of quarter	last day of quarter	do not report	yes= failure to collect at least 90% of required samples no=failure to collect/report 90%-99% of samples
Failure to have State approved and listed qualified operator running the plant	TT	0400	12	Date State learns that the facility does not have a qualified operator	SDWIS/FED will default to 12/31/2015. A State associating a returned to compliance enforcement to this violation will cause SDWIS/FED to adjust the end date to the returned to compliance date	do not report	do not report

Violation	Type	Contaminant Code (C1103)	Type Code (C1105)	Compliance Period Begin Date (C1107)	Compliance Period End Date (C1109)	Severity Indicator count (C1112)[1]	Major Violation Indicator (C1131)
Failure to develop or submit a monitoring plan	0400	27	M&R	30 days after initial compliance date	SDWIS/FED will default to 12/31/2015. A State associating a returned to compliance enforcement to this violation will cause SDWIS/FED to adjust the end date to the returned to compliance date. Returned to compliance is achieved when the State is satisfied that the plan has been developed, submitted or is being followed, depending on the nature of the noncompliance	do not report	always major
Failure to collect source and finished water TOC samples and alkalinity sample	2920	27	M&R	first day of quarter	last day of quarter	do not report	always major
Failure to submit and obtain State approval of a plan detailing significant treatment process modifications prior to making such modifications.	0400	37	M&R	Either date when modification is begun or when the State becomes aware of the modification.	SDWIS/FED will default to 12/31/2015. A State associating a returned to compliance enforcement to this violation will cause SDWIS/FED to adjust the end date to the returned to compliance date. Returned to compliance is achieved when the State notifies the facility that it approves of the modification.	do not report	always major

Violation	Type	Contaminant Code (C1103)	Type Code (C1105)	Compliance Period Begin Date (C1107)	Compliance Period End Date (C1109)	Severity Indicator count (C1112)[1]	Major Violation Indicator (C1131)
Failure to meet the Treatment Technique requirements for DBP Precursor removal.	2920	46	TT	First day of quarter	last day of quarter	do not report	do not report

[1] new numeric field (C1112) in which to record the number of times the MCL/MRDL was exceeded, or the number of samples missed during the month. EPA will use this number to represent the actual number of violations incurred by the water system, for ACR and other statistical purposes.

The following discussions address reporting issues associated with compliance computations and/or violation reporting time frames. Where the water system either has not had one year of sampling data for computing the rolling annual average, or does not operate for a full year, the discussions below should clarify how compliance should be determined under these circumstances. In addition, information regarding violation dates will be provided where the rule compliance computations cross from one month to the next (e.g., where a sample taken on the last day of a month requires additional sampling the next month, and the results indicate noncompliance).

1st Year Running Annual Average Calculations

During the first year of monitoring, water systems cannot compute a complete running annual average (RAA) since a full year of data is not available. The Stage 1 DBPR states that a water system is out of compliance during their first year of monitoring if the sample results would cause an RAA to be exceeded. The following discussion explains how to implement this requirement during the first, second and third quarters of the first year of compliance.

The following calculations should be used during the first year of compliance monitoring (i.e. the 1st year the rule is effective, or the 1st year of operation) for the parameters using an RAA for computing compliance. RAA calculations are used in the compliance-related computations for bromate, HAA5, TTHM, chloramines, chlorine, and DBP precursors (i.e., TOC removal, Specific Ultraviolet Absorbance (SUVA), alkalinity and magnesium hardness).

Routine monitoring for bromate, chloramines and chlorine is conducted on a monthly frequency; compliance calculations are computed quarterly of monthly averages. Each month the average of all samples taken during that month is calculated. To calculate the RAA for monitoring that is conducted monthly, first add the monthly results (or averages) from the previous 12 consecutive months and divide the result by 12. This calculation will be performed at the end of each quarter.

Compliance monitoring for HAA5 and TTHM is conducted on a quarterly frequency. Compliance calculations are computed quarterly of quarterly averages. First, the system will average the results of all their quarterly samples to obtain the quarterly average. To calculate the RAA for monitoring that is conducted quarterly, add the results from the previous four consecutive quarters and divide the result by four.

1st Quarter Computation

For quarterly monitoring parameters, calculate the arithmetic average of the sample results obtained in the quarter. Since only one quarter's results are available, assume that the results for quarters 2, 3, and 4 are zero. Calculate the sum of the quarterly averages (the actual value from quarter 1 plus zeros from quarters 2 through 4), and divide the result by 4. If the result (properly rounded) is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 1st quarter.

For monthly monitoring parameters, calculate the arithmetic average of the sample results obtained in each month. Since after the 1st quarter, only three months of results are available, assume that the results for the remaining 9 months (quarters 2, 3, and 4) are zeros. Calculate the sum of the monthly averages (the actual values from the first three months plus zeros for the last nine months), and divide the result by 12. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 1st quarter.

2nd Quarter Computation

For quarterly monitoring parameters, calculate the arithmetic average of the sample results obtained in the quarters. Since only two quarters' results are available, assume that the results for quarters 3 and 4 are zero. Calculate the sum of the quarterly averages (the actual values from quarters 1 and 2 plus zeros from quarters 3 and 4), and divide the result by 4. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 2nd quarter.

For monthly monitoring parameters, calculate the arithmetic average of the sample results obtained in each month. Since after the 2nd quarter, only six months of results are available, assume that the results for the remaining 6 months (quarters 3 and 4) are zeros. Calculate the sum of the monthly averages (the actual values from the first six months plus zeros for the last six months), and divide the result by 12. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 2nd quarter.

3rd Quarter Computation

For quarterly monitoring parameters, calculate the arithmetic average of the sample results obtained in the quarters. Since only three quarters' results are available, assume that the result for quarter 4 is zero. Calculate the sum of the quarterly averages (the actual value from quarters 1, 2, and 3 plus zero from quarter 4), and divide the result by 4. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 3rd quarter.

For monthly monitoring parameters, calculate the arithmetic average of the sample results obtained in each month. Since after the 3rd quarter, only nine months of results are available, assume that the results for the remaining 3 months (quarter 4) are zeros. Calculate the sum of the monthly averages (the actual values from the first nine months plus zeros for the last three months), and divide the result by 12. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 3rd quarter.

4th Quarter Computation

For quarterly monitoring parameters, calculate the arithmetic average of the sample results obtained in the quarters. Since all the quarters' results are available, calculate the sum of the quarterly averages (the actual values from quarters 1 through 4), and divide the result by 4. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 4th quarter.

For monthly monitoring parameters, calculate the arithmetic average of the sample results obtained in each month. Calculate the sum of the monthly averages (the actual values from all twelve months), and divide the result by 12. If the result is greater than the MCL or MRDL, then the water system is in violation of the MCL or MRDL for the 4th quarter.

Calculating an RAA When There is Data Missing Prior to the Desired Calculation Date

At the end of any monitoring period, when using an RAA in a calculation to define compliance with an MCL or MRDL, and the system has failed to take all of the necessary samples, the system must use the available data. The system must calculate the RAA by dividing the sum of the available data by the number of samples actually taken. For example, when at the end of the 3rd quarter, there is quarterly monitoring parameter data for only quarters 1 and 3, the system must then calculate a sum of the

available data (quarterly averages for quarters 1 and 3) and divide that sum by 2. The result is compared to the MCL or MRDL to determine compliance.

When at the end of the 3rd quarter (9 months) there is monthly monitoring parameter data for only seven of the nine months, the system must calculate the sum of the available data (monthly averages for seven months) and divide the sum by seven. The result is compared to the MCL or MRDL to determine compliance.

Computing RAAs for Seasonal Water Systems

A water system that operates seasonally must collect samples, have the samples analyzed and report results during any monitoring period in which it operates. Compliance with an RAA is calculated in any compliance period by using the data available from the period of operation. For example, if a seasonal water system operates June through September each year, it must collect samples for the 2nd and 3rd quarters of each year. It should collect monthly monitoring samples in each of months June, July, August, and September. During the first year of operation, at the end of the 1st quarter, no RAA calculation is completed, since the system did not operate. At the end of the 2nd quarter, for quarterly parameters, the system should divide the quarterly average value by 2 and compare the result to the MCL or MRDL. For monthly parameters, the system should divide the available monthly average value (June) by 4 and compare the result to the MCL or MRDL. After the first year of operation, an RAA can be calculated at the end of each quarter, using the available data from the previous year.

Reporting Violations of RAA

Due to the complexity associated with recording non-compliance dates for MCL's/MRDL's exceeding standards, EPA has decided to have Primacy Agencies record the quarter in which the sampling results cause the RAA to be exceeded. If the RAA standard continues to be exceeded in subsequent quarters, even if the most recent quarter's values are below the standard, the water system remains out of compliance with the RAA for that quarter and an MCL/MRDL violation for that quarter must be reported to EPA. This situation will continue until a subsequent quarter's sampling results lead to an RAA that no longer exceeds the standards. In addition, where compliance sampling crosses from one month or one quarter to the next, and noncompliance with one or more provisions of the regulations is determined, the Primacy Agency should use as the basis for deciding the month or quarter for which to report the violation the date in which monitoring was performed or samples analyzed/reported that made the Primacy Agency aware that the water system was out of compliance.

Sampling Location and Calculating Compliance

Some parameters can be measured at multiple locations in the distribution system to determine compliance. The values from these measurements are expressed as an average during a month or quarter. Other parameters must be measured at the entry point from each source or treatment plant. A careful determination regarding the correct location or locations for monitoring is necessary for the accurate calculation of an RAA for compliance purposes.

2.1 MCL Violations

General Discussion of Maximum Contaminant Level Violations

DBP MCL violations are reported to SDWIS/FED when the average of sample results for a contaminant exceeds its EPA-established MCL. Since all DBP reporting is for sample averages rather than individual

results, violation Type “02” (“MCL, Average”) is used rather than Type “01” (“MCL, Single Sample”). Table 2-2 presents a summary of the MCL violation reporting codes.

Table 2-2. SDWIS/FED Codes for MCL Reporting Under the Stage 1 DBPR

Violation Code	Contaminant Code	MCL Violations
02	1009	Chlorite MCL
	1011	Bromate MCL
	2456	Haloacetic Acids MCL
	2950	Total Trihalomethanes MCL

The MCL for Chlorite

Water systems using chlorine dioxide as a disinfectant or oxidant are required to monitor for chlorite. Chlorite monitoring consists of taking daily samples at the entrance to the distribution system and one 3-sample set per month in the distribution system. In addition, systems are required to take one 3-sample set in the distribution system the day following any day when a routine entrance to the distribution system sample exceeds the chlorite MCL (1.0 mg/L).

Compliance with the MCL for chlorite is determined by comparing the arithmetic average of each 3-sample set to the MCL of 1.0 mg/L. A system incurs an MCL violation if the average of a 3-sample set is greater than 1.0 mg/L. A system can incur multiple chlorite MCL violations in one month if they are required to collect multiple 3-sample sets.

The MCL for Bromate

Water systems using ozone as a disinfectant or oxidant must perform bromate monitoring. Routine bromate monitoring consists of collecting one sample per month at the entrance to the distribution system from each ozone treatment plant. If a system has multiple plants using ozone, then a distinct compliance determination must be completed for each plant.

Compliance with the MCL for bromate is determined quarterly by comparing the RAA of monthly sample results (or monthly average for months when more than one sample per plant is taken) to the MCL of 0.010 mg/L. Compliance is determined per plant. Therefore, if the bromate RAA from an ozone treatment plant exceeds the MCL, then the system incurs a single MCL violation.

The MCLs for TTHM and HAA5

Systems using chlorine and/or chloramines are required to take TTHM and HAA5 samples in their distribution systems at the point of maximum residence time and at other predetermined sites, depending on the population the system serves.

Compliance with the MCLs for TTHM and HAA5 is determined quarterly by comparing the RAA of quarterly average concentrations to the MCL. The MCL for TTHM is 0.080 mg/L and the MCL for HAA5 is 0.060 mg/L. An RAA of the quarterly averages that is greater than the MCL is a single violation of that MCL for the system.

2.1.1 Type 02/1009: Chlorite MCL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page II-4 & II-5
Section IV-D, page 27
Appendix D, Attachment 6
Cross-reference to Rule:
40 CFR141.133(b)(3)

Table 2-3. Chlorite MCL Violations

Violation Code	Contaminant Code	Violation Description
02	1009	The arithmetic average of any required 3-sample set exceeds the MCL of 1.0 mg/L.

Example System Description - System A

System A is a large Subpart H community water system that serves 11,500 people. The system treats surface water from a river with a conventional filtration plant. Chlorine dioxide is used for taste and odor control and as a primary disinfectant. Chlorine is used as a residual disinfectant in the distribution system. The system has no other sources or treatment plants. Water system monitoring must be performed in accordance with items identified in Table 2.4. For the purposes of this example, only chlorite MCL issues will be discussed.

System A Summary

Population Served:	11,500
Source #1:	Surface Water
Treatment #1:	Conventional filtration, chlorine dioxide, chlorine

Table 2-4. System A Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants							
Chlorine / Chloramines			X		X[1]		
Chlorine Dioxide		X		X			
			X	A 3-sample set must be collected in the distribution system the day following any daily sample that exceeds of 0.8 mg/L at the entrance to the distribution system			
DBPs							
TTHM /HAA5			X			X	
Chlorite (grab)		X		X			
(3-sample set)			X		X		
(3-sample set)			X	A 3-sample set must be collected in the distribution system the day following any daily sample that exceeds 1.0 mg/L at the entrance to the distribution system			
DBP Precursor							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA[2]	X				X		
Magnesium Hardness[2] (as $CaCO_3$)							

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

1 Same date, location and time as total coliform are taken
2 Optional - Alternative compliance criteria of 40 CFR 141.135

System A is a large (> 10,000 people) Subpart H system that must meet the requirements of Stage 1 DBPR beginning January 1, 2002. System A's certified operator collects and analyzes grab samples for chlorite on a daily basis at the entrance to the distribution system. Samples are collected at the locations and according to the schedule specified in the provisions of the monitoring plan, and must be analyzed by a certified laboratory. The operator records the results on a chlorite monitoring form each day and compares the result each day to the 1.0 mg/L level specified for additional chlorite monitoring. If the daily sample is greater than 1.0 mg/L then System A must collect a 3-sample set in the distribution system the following day. Once a month a 3-sample set for chlorite is collected and analyzed. The 3-

sample set is composed of one grab sample near the 1st customer, one grab sample at a location in the distribution system representative of the average system retention time, and one grab sample at a location in the distribution system representative of the maximum system retention time. The locations and results of the analysis of the 3-sample set are recorded on the chlorite monitoring form. The operator calculates the arithmetic average of the results of the 3-sample set, and records that average on the chlorite monitoring form. The operator then compares the results of the 3-sample set average to the chlorite MCL of 1.0 mg/L.

A violation of the MCL for chlorite is defined as any arithmetic average of a 3-sample set that exceeds the 1.0 mg/L MCL established for chlorite. Please refer to Section 2.4.5 for a discussion of chlorite monitoring and reporting violations.

Example #1 - No Chlorite MCL Violation with Single Sample >1.0 mg/L

Table 2-5 summarizes the chlorite monitoring results from March 2002. System A's operator collects the daily entry point to the distribution system grab samples for chlorite on days 1 through 12, and none of the measurements is greater than 1.0 mg/L. On day 13, chlorite is measured at 1.3 mg/L at the entrance to the distribution system. As required on the following day (day 14) a 3-sample set is collected in addition to the daily distribution system entrance sample. The day 14 entrance sample result is 0.9 mg/L and the arithmetic average of the samples taken for the 3-sample set is 0.9 mg/L. The daily distribution system entrance samples are collected on days 15 thru 31, and none of the values exceeds 1.0 mg/L.

Table 2-5. System A March 2002 Chlorite Monitoring Results

Day	Result (mg/L)	> 1.0 mg/L?	3-Sample Set	Arithmetic Average of 3-sample set	MCL Violation
1-12	< 1.0	N	NA	--	No
13	1.3	Y	Required on day 14	--	No
14	0.9	N	0.8, 0.9, 1.0	0.9	No
15-31	< 1.0	N	NA	--	No

Example #1 Decision

System A is in compliance with the chlorite MCL. Since the arithmetic average of the 3-sample set taken on day 14 does not exceed the MCL of 1.0 mg/L, System A is in compliance with the Stage 1 DBPR for chlorite during March 2002. Please note that the 3-sample set collected on day 14 also satisfies the monthly 3-sample set requirement.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System A is in compliance with the Stage 1 DBPR for chlorite, the system must routinely report the information included in Table 2-6 to the Primacy Agency.

Table 2-6. Chlorite Reporting Requirement [40 CFR 141.134]	
For water systems monitoring for chlorite under the requirements of 40 CFR 141.132(b)	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **The water system must report to the Primacy Agency:** (1) The number of entry point samples taken each month for the last three months (2) The location, date and result of each sample (both entry point and distribution system) taken during the last quarter (3) For each month in the reporting period, the arithmetic average of all samples taken in each 3-sample set taken in the distribution system (4) Whether, based upon §141.133(b)(3), the MCL was violated, in which month, and how many times it was violated in each month.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #2 - One Chlorite MCL Violation in a Month

Table 2-7 summarizes the chlorite monitoring results from April, 2002. System A's operator collects the daily distribution system entrance grab sample for chlorite on days 1 through 4, and none of the measurements exceeds 1.0 mg/L. On day 5 she collects the daily entrance sample and the value is 1.1 mg/L. On day 6 the operator collects the daily entrance grab sample and the required 3-sample set. The entrance grab sample measurement is 0.9 mg/L and the arithmetic average from the 3-sample set is 0.8 mg/L chlorite. On days 7 through 20, none of the daily entrance measurements exceeds 1.0 mg/L. On day 21, the daily measurement is 1.4 mg/L. On day 22, the daily measurement is 1.4 mg/L and the arithmetic average of the 3-sample set is 1.3 mg/L. On day 23, the daily sample is 1.0 mg/L and the arithmetic average of the 3-sample set is 0.9 mg/L. On days 24 through 30 none of the daily measurements exceeds 1.0 mg/L chlorite.

Table 2-7. System A April 2002 Chlorite Monitoring Results					
Day	**Result (mg/L)**	**> 1.0 mg/L?**	**3-Sample Set**	**Arithmetic Average of 3-sample set**	**MCL Violation**
1-4	< 1.0	N	NA	--	No
5	1.1	Y	Required day 6	--	No
6	0.9	N	0.9, 0.8, 0.7	0.8	No
7-20	< 1.0	N	NA	--	No
21	1.4	Y	Required day 22	--	No
22	1.4	Y	Required day 23 (1.2, 1.3, 1.4)	1.3	**Yes**
23	1.0	N	0.8, 0.9, 1.0	0.9	No
24-30	< 1.0	N	NA	--	No

Example #2 Decision

System A is in violation of the chlorite MCL for the month of April 2002. The system violated the MCL on day 22, the day when the arithmetic average of the required 3-sample set exceeded the MCL of 1.0 mg/L. The operator reports that the chlorite MCL was violated one time in April 2002.

Public Notice Requirements

System A must provide Tier 2 public notice of the MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for chlorite are summarized in Table 2-6.

Primacy Agency to SDWIS/FED Reporting

The Primacy Agency must report one chlorite MCL violation to SDWIS/FED. When this type of violation occurs, the Primacy Agency must use a severity indicator to report the number of times during the month that the MCL violation occurred. Regardless of how many violations occur in one month, a single violation is reported to EPA, with the number of MCL violations recorded in the field called "Severity Indicator Count" (C1112). ***SDWIS Reporting Code: 02/1009***.

The appropriate SDWIS/FED chlorite MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.1.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1009
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be one month later than C1107*
C1112	Severity Indicator Count	*Number of times the MCL is violated*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234573	0200001		I	C1103	1009		
D1	GA1234573	0200001		I	C1105	02		
D1	GA1234573	0200001		I	C1107	20020401		
D1	GA1234573	0200001		I	C1109	20020430		
D1	GA1234573	0200001		I	C1112	1		

Exhibit 2.1 Chlorite MCL Violation Data Element Table and DTF Transactions

Example #3 - Multiple Chlorite MCL Violations in a Month

Table 2-8 summarizes the chlorite monitoring results for August 2002. System A's operator collects the daily entrance grab sample for chlorite on days 1 through 5, and none of the measurements exceeds 1.0 mg/L. On day 6, she collects the daily entrance sample and the value is 1.2 mg/L. On day 7, she collects the entrance grab sample and the required 3-sample set. The entrance grab sample measurement is 0.9 mg/L and the arithmetic average from the 3-sample set is 0.9 mg/L chlorite. On days 8 through 13, none of the daily measurements exceeds 1.0 mg/L. On day 14, the daily measurement is 1.4 mg/L. On day 15, the daily measurement is 1.3 mg/L and the arithmetic average of the required 3-sample set is 1.2 mg/L. On day 16, the daily sample is 1.1 mg/L and the arithmetic average of the 3-sample set is 1.1 mg/L. A 3-sample set is required on Day 17. On day 17, neither the daily sample nor the 3-sample set exceeds 1.0 mg/L. On days 18 through 31, none of the daily measurements exceeds 1.0 mg/L chlorite.

Table 2-8. System A August 2002 Chlorite Monitoring Results					
Day	**Result (mg/L)**	**> 1.0 mg/L?**	**3-Sample Set**	**Arithmetic Average of 3-sample set (mg/L)**	**MCL Violation ?**
1- 5	< 1.0	NO	NA	NA	NA
6	1.2	YES	Required Day 7	NA	NO
7	0.9	NO	0.8, 0.9, 1.0	Avg = 0.9	NO
8 - 13	< 1.0	NO	NA	NA	NO
14	1.4	YES	Required Day 15	NA	NO
15	1.3	YES	Required Day 16 1.1, 1.2, 1.3	Avg = 1.2	**YES**
16	1.1	YES	Required Day 17 1.0, 1.1, 1.2	Avg = 1.1	**YES**
17	0.8	NO	0.6, 0.7, 0.8	Avg = 0.7	NO
18 - 31	< 1.0	NO	NO	NA	NO

Example #3 Decision

System A violated the chlorite MCL two times in the month of August, 2002. The violations occurred on day 15 and day 16, when the arithmetic average of the required 3-sample set exceeded the MCL of 1.0 mg/L.

Public Notice Requirements

System A must provide Tier 2 Public notice of the MCL violations according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for chlorite are summarized in Table 2-6.

Primacy Agency to SDWIS/FED Reporting

The Primacy Agency must report the chlorite MCL violations to SDWIS/FED. It must report that the MCL was violated two times during the month of August 2002. The Primacy Agency is not required to report either the exact dates within the month of August 2002 when the MCL was violated, or specific analytical data regarding the MCL violations, only that the MCL was violated two times during the month. When this type of violation occurs, the Primacy Agency must use a severity indicator to report the number of times during the month that the MCL violation occurred. Regardless of how many violations occur in one month, a single violation DTF transaction is reported to EPA, with the number of MCL violations recorded in the field called "Severity Indicator Count" (C1112). ***SDWIS Reporting Code: 02/1009***.

The appropriate SDWIS/FED chlorite MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.2.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1009
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be one month later than C1107*
C1112	Severity Indicator Count	*Number of times the MCL is violated*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234573	0200001		I	C1103	1009		
D1	GA1234573	0200001		I	C1105	02		
D1	GA1234573	0200001		I	C1107	20020801		
D1	GA1234573	0200001		I	C1109	20020831		
D1	GA1234573	0200001		I	C1112	2		

Exhibit 2.2 Chlorite MCL Violation Data Element Table and DTF Transactions

Example #4 - Routine Daily Monitoring and Routine 3-Sample Set

Table 2-9 summarizes the chlorite monitoring results for September, 2002. System A's operator collects the daily entrance sample on days 1 thru 29 and none of the measurements is greater than 1.0 mg/L. On day 30, in addition to the daily distribution system entrance sample, the required monthly 3-sample set is collected. The daily sample result is 0.8 mg/L and the arithmetic average of the samples taken for the 3-sample set is 0.9 mg/L.

Table 2-9. System A September 2002 Chlorite Monitoring Results

Day	Result (mg/L)	> 1.0 mg/L?	3-Sample Set	Arithmetic Average of 3-sample set (mg/L)	MCL Violation ?
1- 29	< 1.0	NO	NA	NA	NO
30	0.8	NO	0.7, 0.9, 1.1	Avg = 0.9	NO

Example #4 Decision

System A is in compliance with the chlorite MCL for September 2002 since the arithmetic average of the routine 3-sample set did not exceed the chlorite MCL of 1.0 mg/L.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System A is in compliance with the Stage 1 DBPR for chlorite, the system must routinely report the information included in Table 2-6 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.1.2 Type 02/1011: Bromate MCL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page II-4 & II-5
Section IV-D, page 26
Appendix D, Attachment 7
Cross-reference to Rule:
40 CFR141.133(b)(2)

Table 2-10. Bromate MCL Violation

Violation Code	Contaminant Code	Violation Description
02	1011	A violation occurs when the running annual arithmetic average computed quarterly of monthly samples, or for months in which the system takes more than one sample, the average of all samples taken during the month exceeds the MCL of 0.010 mg/L.

Note: See Section 2 for a discussion of calculating the RAA for the 1st year of operation.

Example System Description - System B

System B is a small Subpart H community water system that serves 8,000 people. The system has a conventional treatment plant using water from a river that experiences high turbidity and high total organic carbon (TOC) readings. The system uses ozone for disinfection and oxidation on a routine basis and also adds chlorine to the water entering the clearwell.

In addition to the surface water source, System B has a series of wells that are connected by manifold at a treatment facility where all the water is treated for removal of iron and manganese. Ozone is used as an oxidant for the dissolved metals and chlorine is added as a secondary disinfectant. The system, therefore, utilizes two ozone treatment plants and the water is introduced into the distribution system at two entry points.

System B Summary

Population Served:	8,000
Source #1:	Surface water
Treatment #1:	Conventional filtration, ozone, chlorine
Source #2:	Ground water (seasonal use)
Treatment #2:	Ozone, chlorine, filtration for iron removal

System B, as a Subpart H system that serves fewer than 10,000 people, must meet the requirements of Stage 1 DBPR beginning January 1, 2004. The Stage 1 DBPR requires any system utilizing ozone to comply with the MCL and monitoring requirements for bromate (a DBP of ozone). System B must collect and analyze one grab sample for bromate during each month at the entrance to the distribution system from each ozone plant. The certified operator collects the bromate samples during times when the ozonation systems are operating under normal conditions at the locations and according to the schedule specified in the monitoring plan. Bromate samples must be analyzed by a certified laboratory. Water system monitoring must be performed in accordance with Tables 2-11a and 2-11b.

Table 2-11a. System B (Source # 1) Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X[1]		
DBPs:							
TTHM /HAA5			X			X	
Bromate		X			X		
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA*	X				X		
Bromide**	X(source)				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria of 40 CFR141.135
** Optional for reduced bromate monitoring
1 Same date, location and time as total coliform are taken

Table 2-11b. System B (Source # 2) Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X[1]		
DBPs:							
TTHM /HAA5			X			X	
Bromate		X			X		
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA*	X				X		
Bromide**	X(source)				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria requirement of 40 CFR141.135
** Optional for reduced bromate monitoring
1 Same date, location and time as total coliform are taken

Example #5 - Calculating Bromate Compliance for 1st Quarter During 1st Year of Monitoring

Table 2-12 summarizes the bromate monitoring results for the first quarter of 2004. In January, February, and March 2004, System B's operator collects the grab samples for bromate at the entrance to the distribution system from both ozone plant 1 and ozone plant 2. He records the results on the bromate monitoring form. On March 31, 2004, when the 1st quarter of the calendar year is over, he calculates, for each ozonation plant, the average of the monthly January 2004, February 2004 and March 2004 samples. He assumes that the remaining nine months of the 1st year are zero, and he divides the 1st quarter average of the available monthly bromate concentrations for plant 1 (0.025 mg/L) and the average of the monthly concentrations for plant 2 (0.010 mg/L) by 12.

Example #5 Decision

System B is in compliance with the bromate MCL during the 1st quarter of 2004 (January, February, and March, 2004). Since System B has not completed a full year of bromate monitoring, the operator cannot calculate compliance with the bromate MCL using an RAA. The 1st year RAA calculation methodology must be used. For each plant that the sum of the available monthly bromate monitoring average values

must be calculated, bromate concentrations of 0 mg/L are assumed for any months in the year for which monitoring has not yet occurred, and the sum is divided by twelve for comparison to the MCL. See Section 2 for a full discussion of 1st year RAA calculation methodology.

Table 2-12. System B 1st Quarter 2004 Bromate Monitoring Results

Month		Plant #1 (mg/L)	Plant #2 (mg/L)
January		0.028	0.014
February		0.020	0.009
March		0.027	0.007
2nd Quarter[1]			
3rd Quarter[1]			
4th Quarter[1]			
Compliance Calculation	**Sum**	0.075	0.030
	÷ 12	0.00625	0.0025
	Q1 RAA	0.006 < 0.010	0.003 < 0.010

[1] To calculate compliance for the 1st quarter, assume the results for 2nd, 3rd, and 4th quarters are zero. See Section 2 for a detailed discussion on calculating the RAA during the first year on monitoring.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System B is in compliance with the bromate MCL, it must routinely report the following information to the Primacy Agency.

Table 2-13. Bromate Reporting Requirement [40 CFR 141.134]

For water systems monitoring for bromate under the requirements of 40 CFR141.132(b)	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **The water system must report to the Primacy Agency:** (1) The number of samples taken during the last quarter (2) The location, date and result of each sample taken during the last quarter (3) The arithmetic average of the monthly arithmetic average of all samples taken in the last year (4) Whether, based on §141.133(b)(2), the MCL was violated

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #6 - Calculating Bromate Compliance for 2nd Quarter During 1st Year of Monitoring

Table 2-14 summarizes the bromate monitoring results for the 2nd quarter of 2004. In April, May and June of 2004, System B's operator collects the grab samples for bromate at the entrance to the distribution system from both ozone plant 1 and ozone plant 2. He records the results on the bromate monitoring form. On June 30, 2004, when the 2nd quarter of the calendar year is over, he calculates the monthly averages of the samples for each ozonation plant. He records the 2nd quarter monthly average bromate concentration values on the bromate monitoring form.

Table 2-14. System B 2nd Quarter 2004 Bromate Monitoring Results

Month		Plant #1 Distribution System Entrance Result (mg/L)	Plant #2 Distribution System Entrance Result (mg/L)
1st Quarter		0.028, 0.020, 0.027	0.014, 0.009, 0.007
2nd Quarter		0.018, 0.028, 0.020	0.006, 0.015, 0.009
3rd Quarter[1]			
4th Quarter[1]			
Compliance Calculation	Sum	0.141	0.060
	÷ 12	0.01175 = 0.012	0.005
	2nd Quarter RAA	0.012 > 0.010	0.005 < 0.010

[1] To calculate compliance for the 2nd quarter, assume the results for the 3rd and 4th quarters are zero. See Section 2 for a detailed discussion on calculating the RAA during the first year of monitoring.

Example #6 Decision

System B is in violation of the bromate MCL for the 2nd quarter of 2004. In addition, System B will be in violation of the bromate MCL for the 3rd and 4th quarters of 2004 as well, regardless of the bromate concentrations measured during those quarters. System B's operator must report a violation of the bromate MCL because of the results for ozonation plant 1. The system has not completed a full year of bromate monitoring, but the sum of the available monthly bromate concentrations plus concentrations of 0 mg/L for the months for which monitoring has not yet occurred divided by twelve already exceeds the bromate MCL (0.010 mg/L).

Public Notice Requirements

System B must provide Tier 2 public notice of this MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for bromate are summarized in Table 2-13.

Primacy Agency to SDWIS/FED Reporting

A violation is reported for the entire water system, even though only one treatment plant was found to be out of compliance. Primacy Agencies should provide the compliance period begin and end dates, but

should not provide an analytic result to SDWIS as part of the report of a bromate violation. ***SDWIS Reporting Code 02/1011***.

The appropriate SDWIS/FED bromate MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.3.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1011
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234572	0400001		I	C1103	1011		
D1	GA1234572	0400001		I	C1105	02		
D1	GA1234572	0400001		I	C1107	20040401		
D1	GA1234572	0400001		I	C1109	20040630		

Exhibit 2.3 Bromate MCL Violation Data Element Table and DTF Transactions

Example #7 - Calculating Bromate Compliance Based on a Complete Year of Data

Table 2-15 summarizes the bromate monitoring results for 2004. On December 15, 2004 System B's operator collects the grab samples for bromate at the entrance to the distribution system from both ozone plant 1 and ozone plant 2. Results are recorded on the bromate monitoring form. Since System B has completed a full year of bromate monitoring, the operator calculates the RAA for each plant. First, he calculates the sum of the 12 monthly values, then divides the sum by 12. This calculation is complete for each plant. The RAA for plant 1 is 0.020 mg/L and for plant 2 is 0.010 mg/L.

Example #7 Decision

System B is in violation of the bromate MCL. The operator must report a violation of the bromate MCL because of the results for ozone plant 1 (i.e., the RAA exceeds 0.010 mg/L).

Table 2-15. System B 4th Quarter 2004 Bromate Monitoring Results			
Month		**Plant #1 Distribution System Entrance Result (mg/L)**	**Plant #2 Distribution System Entrance Result (mg/L)**
1st Quarter		0.028, 0.020, 0.027	0.014, 0.009, 0.007
2nd Quarter		0.018, 0.028, 0.020	0.006, 0.015, 0.009
3rd Quarter		0.015, 0.029, 0.014	0.006, 0.014, 0.008
4th Quarter		0.014, 0.020, 0.007	0.012, 0.008, 0.012
Compliance Calculation	**Sum**	0.240	0.120
	÷ 12	0.020	0.010
	4th Quarter RAA	0.020 > 0.010	0.010 ≤ 0.010

Public Notice Requirements

System B must provide Tier 2 public notice of the MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for bromate are summarized in Table 2-13.

Primacy Agency to SDWIS/FED Reporting

Primacy Agencies report noncompliance for the entire water system. If one plant is in violation then the system is in violation. ***SDWIS Reporting Code 02/1011***.

The appropriate SDWIS/FED bromate MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.4.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1011
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234572	0500001		I	C1103	1011		
D1	GA1234572	0500001		I	C1105	02		
D1	GA1234572	0500001		I	C1107	20041001		
D1	GA1234572	0500001		I	C1109	20041231		

Exhibit 2.4 Bromate MCL Violation Data Element Table and DTF Transactions

Example #8 - Calculating RAA for Bromate

Table 2-16 summarizes the bromate monitoring results for July 2004 to June 2005. On June 15, 2005 System B's operator collects the grab samples for bromate at the entrance to the distribution system from both ozone plant 1 and ozone plant 2. He records the results on the bromate monitoring form.

For plant 1 the bromate concentration is 0.010 mg/L and for plant 2 the concentration is 0.008 mg/L. The operator makes operational adjustments to plant 1, requests permission from the Primacy Agency, and collects additional bromate samples at the entrance to the distribution system from plant 1 on June 17, 2005 (0.005 mg/L), and on June 25, 2005 (0.006 mg/L). Since more than the one compliance sample was collected from plant 1, the operator must use all of the data when determining compliance. Therefore, he calculates the average of the 3 samples collected in June 2005 for plant 1.

Since the 2nd calendar quarter is over and System B's operator has completed more than a full year of bromate monitoring, the bromate RAA must be calculated for each plant, and that value compared to the bromate MCL.

To calculate an RAA, the operator calculates the sum of the monthly bromate values (or the monthly average concentration values, if more than one sample per month is taken) for June 2005, May 2005, April 2005, March 2005, February 2005, January 2005, December 2004, November 2004, October 2004, September 2004, August 2004 and July 2004 (see Table 2-16). That sum is divided by 12 to create an arithmetic average of monthly averages. This value is recorded on the bromate monitoring form for each plant. The RAA for plant 1 is 0.010 mg/L and for plant 2 is 0.009 mg/L.

Table 2-16. System B RAA Bromate Monitoring Results			
Month/Quarter		**Plant #1 Distribution System Entrance Result (mg/L)**	**Plant #2 Distribution System Entrance Result (mg/L)**
July 2004		0.015	0.006
August 2004		0.029	0.014
September 2004		0.014	0.008
October 2004		0.014	0.012
November 2004		0.020	0.008
December 2004		0.007	0.012
January 2005		0.002	0.009
February 2005		0.004	0.007
March 2005		0.002	0.010
April 2005		0.005	0.007
May 2005		0.003	0.009
June 2005 results		0.010, 0.005, 0.006 **avg = 0.007**	0.008
Compliance Calculations	**Sum**	0.122	0.110
	÷ 12	0.01017 = 0.010	0.00917 = 0.009
	2nd Quarter RAA	0.010 ≤ 0.010	0.009 ≤ 0.010

Example #8 Decision

System B is in compliance with the MCL for bromate for the RAA compliance period of July 1, 2004 to June 30, 2005. Therefore, the Primacy Agency does not report any information to EPA for this time period.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System B is in compliance with the Stage 1 DBPR for bromate, the system must routinely report the information included in Table 2-13 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #9 - Bromate MCL Exceedance

Assume all of the facts from Example #8, however, assume that the monitoring results for the period July 2004 to June 2005 are as shown below in Table 2-17. Assume that the sum of monthly average bromate concentrations for plant #1 is 0.096 mg/L, and that the sum of the monthly average bromate concentrations for plant #2 is 0.130 mg/L. At the end of June 2005, upon calculation of the RAA for plant 1 the result is 0.008 mg/L bromate and for plant 2 the result is 0.011 mg/L bromate.

Table 2-17. System B June 2005 RAA Bromate Monitoring Results

Month/Quarter		Plant #1 Distribution System Entrance Result (mg/L)	Plant #2 Distribution System Entrance Result (mg/L)
Compliance Calculations	**Sum**	0.096	0.130
	÷ 12	0.008	0.0108 = 0.011
	2nd Quarter RAA	0.008 ≤ 0.010	0.011 > 0.010

Example #9 Decision

System B must report a violation of the MCL for bromate at the end of June 2005, for the compliance period of April 1, 2005 to June 30, 2005. The running annual arithmetic average of monthly average concentrations of bromate exceeds the 0.010 mg/L MCL at plant 2. An MCL violation at one plant results in violation status for the entire system.

Public Notice Requirements

System B must provide Tier 2 public notice of this MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for bromate are summarized in Table 2-13.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED bromate MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.5. The violation compliance period is to be reported representing the quarter in which the compliance condition was determined (4/2005-6/2005). ***SDWIS Reporting Code 02/1011.***

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1011
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234572	0500001		I	C1103	1011		
D1	GA1234572	0500001		I	C1105	02		
D1	GA1234572	0500001		I	C1107	20050401		
D1	GA1234572	0500001		I	C1109	20050630		

Exhibit 2.5 Bromate MCL Violation Data Element Table and DTF Transactions

Example #10 - CWS Fails to Collect Several Required Bromate Samples

Table 2-18 summarizes the bromate monitoring results for 2006. On December 15, 2006 System B's operator collects the monthly grab samples for bromate at the entrance to the distribution system from both ozone plant 1 and ozone plant 2. After analysis he records the results on the bromate monitoring form. At the end of the monitoring quarter System B's operator reviews the preceding twelve months' data in order to calculate an RAA of monthly bromate concentrations.

Example #10 Decision

Review of the preceding twelve months of data shows that bromate samples were taken in only 8 of the 12 months. The operator must sum the available monthly average values and divide by the actual number of months in which samples were taken, in this case eight. Compliance with the MCL is determined on the basis of the available data. It is important to note, that although no MCL violation was defined, monitoring and reporting violations are present in the 1st, 2nd and 4th quarters of 2006. See Section 2.4.3 for a discussion of bromate M&R violations. Further example #10 discussions only address the Bromate MCL compliance issues.

Public Notice Requirements

Because the system is in compliance with the Bromate MCL, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System B is in compliance with the Stage 1 DBPR MCL for bromate, the system must routinely report the information included in Table 2-13 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance with the Bromate MCL, no SDWIS/FED reporting is required for this parameter for this reporting period.

Table 2-18. System B 2006 RAA Bromate Monitoring Results

Month		Plant #1 Distribution System Entrance Result (mg/L)	Plant #2 Distribution System Entrance Result (mg/L)
January 2006		0.011	0.012
February 2006		0.008	0.007
March 2006		no data	no data
April 2006		no data	no data
May 2006		0.009	0.009
June 2006		no data	no data
July 2006		0.003	0.010
August 2006		0.005	0.005
September 2006		0.012	0.018
October 2006		no data	no data
November 2006		0.013	0.006
December 2006		0.009	0.011
Compliance Calculations	**Sum**	0.070	0.078
	÷ 8	0.00875 = 0.009	0.00975 = 0.010
	4th Quarter RAA	0.009 ≤ 0.010	0.010 ≤ 0.010

2.1.3 Type 02/2456: HAA5 (Five Haloacetic Acids) MCL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page 4 & 5
Appendix D - Attachments 1,2,3,4, & 5
Cross-reference to Rule:
40 CFR141.133(b)(1)

Table 2-19. HAA5 MCL Violation

Violation Code	Contaminant Code	Violation Description
02	2456	The running annual arithmetic average, computed quarterly, of quarterly averages, exceeds the MCL of 0.060 mg/L. The Primacy Agency will record the begin and end dates of the violation representing the quarter in which the results of the samples exceed the MCL. If a water system misses one or more samples during that quarter, then only the available values are used in the computation.

Example System Description - System C

System C is a large Subpart H community water system serving 58,000 people, that uses a lake as its source and meets the Subpart H filtration avoidance criteria. The system supplies water treated with chlorine to meet the disinfection requirements of the Surface Water Treatment Rule. The system utilizes only one source and one treatment plant. The MCL established in the Stage 1 DBPR for HAA5 is 0.060 mg/L and compliance is based upon a running annual arithmetic average computed quarterly of quarterly averages.

System C Summary

Population Served:	58,000
Source #1:	Surface Water
Treatment:	Successfully avoiding filtration, chlorine

Any Subpart H community or NTNC water system serving 10,000 or more people (large Subpart H system), and utilizing a chemical disinfectant to treat their water must meet the requirements of Stage 1 DBPR beginning January 1, 2002. The requirements of the Stage 1 DBPR include an MCL for Five Haloacetic Acids (HAA5), as well as the requirement to monitor for HAA5. Each quarter, System C's certified operator collects four distribution grab samples and has them analyzed by a certified laboratory for HAA5.

HAA5 samples are taken during times when the disinfection system is operating under normal conditions and samples are collected at the locations and according to the schedule specified in the provisions of the monitoring plan, including at least 25% in a location representing maximum residence time. Please see 40 CFR141.132(b) for routine monitoring requirements. Table 2-20 summarizes System C's monitoring requirements.

The certified operator records the results on an HAA5 monitoring form each quarter and at the end of each calendar quarter calculates a quarterly average concentration of HAA5. He also calculates an average HAA5 concentration for the previous year (using a running annual arithmetic average of the

quarterly average for the quarter just completed and the average values for the three previous quarterly monitoring periods). He compares the result to the HAA5 MCL of 0.060 mg/L. A violation of the MCL for HAA5 is defined as any running annual arithmetic average computed quarterly – of quarterly arithmetic averages of all samples collected – that exceeds the 0.060 mg/L MCL established for HAA5.

During the 1st full year of HAA5 monitoring, at the end of each calendar quarter, the operator calculates the sum of the available quarterly averages, assumes zeros for quarters for which monitoring has not yet occurred, divides the result by four, compares the result to the MCL and records the value on the HAA5 monitoring form. Section 2.1 discusses compliance calculations for the first year of compliance monitoring in more detail. Please refer to Section 2.4.7 for a discussion of monitoring and reporting violations for HAA5.

Table 2-20. System C Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X[1]		
DBPs:							
TTHM /HAA5			X			X	

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

[1] Same date, location, and time as total coliform samples are collected.

Example #11 - HAA5 MCL RAA Calculating After 1st Quarter

Table 2-21 summarizes the HAA5 monitoring results for 2002. On February 20, 2002, System C's operator collects the four required HAA5 samples in the distribution system for the 1st quarterly period of 2002. The results are 0.038 mg/L, 0.012 mg/L, 0.060 mg/L and 0.041 mg/L. He calculates an arithmetic average of the values and records the result on the HAA5 monitoring sheet. The arithmetic average for the 1st quarter of 2002 is 0.038 mg/L.

Table 2-21. System C 1st Quarter 2002 HAA5 Monitoring Results		
Month/Quarter		**Results (mg/L)**
February 2002/ Quarter 1		0.038, 0.012, 0.060, 0.041
Average		(0.038 + 0.012 + 0.060 + 0.041) = 0.151 / 4 = 0.038
Compliance Calculations	**Sum**	0.038
	÷ 4	0.0095 = 0.010
	1st Quarter RAA	0.010 < 0.060

Example #11 Decision

At the end of March 2002, since System C's operator has not completed one year of HAA5 monitoring, the method of calculating 1st year RAA is used. The 1st quarterly average value of 0.038 mg/L is used and it is assumed, for purposes of the calculation, that the next three quarterly average values are zero. The 1st year RAA is calculated as shown in Table 2-21. The calculated RAA of 0.010 mg/L is less than the MCL of 0.060 mg/L set for HAA5. The system is in compliance for the 1st quarter of 2002.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System C is in compliance with Stage 1 DBPR for HAA5, the system must routinely report the information summarized in Table 2-22 to the Primacy Agency, according to the requirements of 40 CFR141.134.

Table 2-22. TTHM and HAA5 Reporting Requirement [40 CFR 141.134]	
For water systems monitoring for TTHM and HAA5 under the requirements of 40 CFR141.132(b)	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **The water system must report to the Primacy Agency:** (1) The number of samples taken during the last quarter (2) The location, date and result of each sample taken during the last quarter (3) The arithmetic average of all samples taken in the last quarter (4) The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters (5) Whether, based on §141.133(b)(1), the MCL was violated

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #12 - HAA5 Compliance Calculation During 1st Year of Monitoring

On May 20, 2002, System C's operator collects the four required HAA5 samples in the distribution system for the 2nd quarterly period of 2002. The results are 0.209 mg/L, 0.100 mg/L, 0.168 mg/L and 0.610 mg/L. He calculates an arithmetic average of the values and records the result on the HAA5 monitoring sheet shown in Table 2-23. The arithmetic average is 0.272 mg/L.

Table 2-23. System C 2002 HAA5 Monitoring Results

Month/Quarter		Plant #1 Distribution System Results (mg/L)
Feb 2002/ Quarter 1		0.038, 0.012, 0.060, 0.041
1st Quarter Average		(0.038 + 0.012 + 0.060 + 0.041) = 0.151 / 4 = 0.038
May 2002/ Quarter 2		0.209, 0.100, 0.168, 0.610
2nd Quarter Average		(0.209 + 0.100 + 0.168 + 0.610) / 4 = 0.272
Compliance Calculation	**Sum**	(0.038 + 0.272) = 0.310
	÷ 4	0.0775 = 0.078
	2nd Quarter RAA	0.078 > 0.060

Example #12 Decision

System C is in violation of the HAA5 MCL. At the end of June 2002, since system C's operator has not completed one year of HAA5 monitoring, he must use the methodology for calculating the RAA within the 1st year of monitoring. The 1st quarterly average value is 0.038 mg/L and the 2nd quarterly average value is 0.272 mg/L. He assumes the next two average results of quarterly monitoring are each equal to zero, and calculates the RAA = 0.078 mg/L as shown in Table 2-23. The RAA exceeds the MCL of 0.060 mg/L set for HAA5. A violation of the MCL for HAA5 is defined. A violation of the HAA5 MCL at the end of June 2002 must be reported for the compliance period April 1, 2002 to June 30, 2002. The operator will also need to report MCL violations for HAA5 at the end of September 2002, December 2002, and March 2003.

Beginning January 1, 2002, System C must comply with the requirements of the Interim Enhanced Surface Water Treatment Rule (IESWTR) as well as the requirements of the Stage 1 D/DBP Rule. One IESWTR requirement is that water systems avoiding filtration must comply with the requirements of the Stage 1 D/DBP Rule as a condition of their filtration avoidance determination. In Example #12, System C has violated the HAA5 MCL, and is therefore not in compliance with the Stage 1 D/DBP Rule. The State or Primacy Agency should consider whether System C's filtration avoidance determination should be revoked because of the HAA5 MCL violation.

Public Notice Requirements

System C must provide Tier 2 public notice of this MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

The reporting requirements for HAA5 are summarized in Table 2–22.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED HAA5 MCL violation data elements are listed below. The Primacy Agency must also report these violations to EPA after the monitoring for the quarter is completed, even though the water system's noncompliance is known in advance. Exhibit 2.6 shows the data elements and individual DTF transactions. ***SDWIS Reporting Code 02/2456***.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	2456
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	
D1	GA1234571	0200001		I	C1103	2456		
D1	GA1234571	0200001		I	C1105	02		
D1	GA1234571	0200001		I	C1107	20020401		
D1	GA1234571	0200001		I	C1109	20020630		

Exhibit 2.6 HAA5 MCL Violation Data Element Table and DTF Transactions

Example #13 - HAA5 MCL Full Year RAA Calculation

Table 2-24 summarizes the HAA5 monitoring results for 2003. On June 20, 2003, System C's operator collects the four required HAA5 samples in the distribution system for the 2nd quarterly period of 2003. The results are 0.030 mg/L, 0.015 mg/L, 0.050 mg/L and 0.041 mg/L. He calculates an arithmetic average of the values and records the result on the HAA5 monitoring sheet. The arithmetic average for the 2nd quarter of 2003 is 0.034 mg/L. The quarterly averages for the previous 3 quarters are: 0.029 mg/L, 0.040 mg/L, and 0.025 mg/L. The RAA for this period is 0.032 mg/L.

Table 2-24. System C 2nd Quarter 2003 HAA5 Monitoring Results		
Quarter		**Quarterly Average (mg/L)**
Q3 2002		0.029
Q4 2002		0.040
Q1 2003		0.025
Q2 2003		(0.030 + 0.015 +0.050 +0.041) / 4 = 0.034
Compliance Calculations	**Sum**	0.128
	÷ 4	0.032
	2rd Quarter RAA	0.032 < 0.060

Example #13 Decision

System C is in compliance with the MCL for HAA5 at the end of June, 2003. Table 2- 24 presents the RAA calculations for System C.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

The reporting requirements for HAA5 are summarized in Table 2–22.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example# 14 - HAA5 Missing Samples

Table 2-25 summarizes the monitoring results for HAA5 through September 2003. On October 1, 2003, System C's operator returns from a vacation and finds that no HAA5 samples were collected as scheduled for the 3rd quarter of 2003. Four HAA5 grab samples should have been taken in the 3rd quarter.

System C's operator must calculate an RAA at the end of the 3rd quarter using the available data. Since he does not have sample results for the 3rd quarter, he calculates the sums of the quarterly average HAA5 values for the 2nd and 1st quarters of 2003 and the 4th quarter of 2002. He then divides that sum by 3 to produce the RAA value to compare to the MCL for determining compliance. The data used in the RAA calculation is presented in Table 2-25.

Table 2-25. System C 2nd Quarter 2003 HAA5 RAA Monitoring Results		
Quarter		**Quarterly Average (mg/L)**
4th Quarter 2002		0.040
1st Quarter 2002		0.025
2nd Quarter 2003		0.034
3rd Quarter 2003		No Data
Compliance Calculations	**Sum**	0.099
	÷ 3	0.033
	3rd Quarter RAA	0.033 < 0.060

Example #14 Decision

System C is in compliance with the HAA5 MCL at the end of the 3rd quarter of 2003. However, the system must report an M&R violation for failing to collect and analyze its HAA5 samples for the 3rd quarter of 2003. Please see Section 2.4.7 for a discussion of HAA5 M&R violations. All further discussions on Example #14 only address the MCL compliance issues.

Public Notice Requirements

Because the system is in compliance with the HAA5 MCL , no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System C is in compliance with the MCL for HAA5, the operator must routinely report the information presented in Table 2–22 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance with the HAA5 MCL, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.1.4 Type 02/2950: TTHM (Total Trihalomethanes) MCL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page 4 & 5
Appendix D, Attachments 1,2,3,4 & 5
Cross-reference to Rule:
40 CFR141.133(b)(1)

Table 2-26. TTHM MCL Violation

Violation Code	Contaminant Code	Violation Description
02	2950	The running annual arithmetic average, computed quarterly, of quarterly averages, exceeds the MCL of 0.080 mg/L

Example System Description - System D

System D is a small Subpart H system serving 8,200 people that uses 3 large groundwater wells determined to be under the direct influence of surface water. The system treats the water from each well by filtration through cartridge and bag filters and by disinfection with chlorine gas on a full-time basis. The system utilizes three filtration/disinfection treatment plants known as TP 1, TP 2 and TP 3.

System D Summary

Population Served:	8,200
Source #1:	Well 1
Treatment:	Filtration, chlorine
Source #2:	Well 2
Treatment:	Filtration, chlorine
Source #3:	Well 3
Treatment:	Filtration, chlorine

Any Subpart H community or NTNC water system serving less than 10,000 people (small Subpart H system), and utilizing a chemical disinfectant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2004. The requirements of the Stage 1 DBPR include an MCL for Total Trihalomethanes (TTHM), as well as the requirement to monitor for TTHM. System D's certified operator collects and has a certified laboratory analyze one grab sample per plant for TTHM during the 1st month of each quarter in a location within the distribution system from each plant that represents maximum residence time.

In an effort to enhance operational control and better protect public health, the operator also collects and analyzes one grab sample per plant at the points of maximum residence time during the 2nd and 3rd months of each quarter. This sample frequency is described in the system monitoring plan submitted to the Primacy Agency. A summary of System D's monitoring requirements is presented in Table 2-27. He takes the TTHM samples during times when the disinfection systems are operating under normal conditions and he collects the samples at the locations (i.e. points of maximum residence time) and according to the schedule specified in the provisions of the monitoring plan. He records the results of the samples on a TTHM monitoring form each month and at the end of each calendar quarter he calculates a quarterly average concentration of TTHM for the system. All existing sample data must be used in this

calculation, even though he has sampled more frequently than required for a system of System D's size. He also calculates an average TTHM concentration for the system for the previous year (a running annual arithmetic average of the quarterly average for the quarter just completed and the average values for the three previous quarterly monitoring periods) and compares the result to the TTHM MCL of 0.080 mg/L.

Table 2-27. System D Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants							
Chlorine			X		X		
DBPs							
TTHM /HAA5			X		X[1]		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

[1] System is required to collect one sample per plant per quarter. However, additional monitoring is performed for process control as outlined in the monitoring plan

A violation of the MCL for TTHM is defined as any running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected, that exceeds the 0.080 mg/L MCL established for TTHM. Additionally, during the 1st full year of TTHM monitoring, at the end of each calendar quarter, the operator calculates the sum of the available quarterly averages and records the value on the TTHM monitoring form. During the 1st full year of TTHM monitoring, a violation of the MCL for TTHM is defined for the system when the sum of the available quarterly (average) TTHM concentrations plus assumed zeros for quarters for which monitoring has not yet been performed, divided by four, will yield a result greater than the MCL of 0.080 mg/L set for TTHM. Please refer to Section 2.4.7 for a discussion of monitoring and reporting for TTHM.

Example #15 - TTHM MCL 1st Quarter of Data

Table 2-28 summarizes the TTHM monitoring results for the 1st quarter of 2004. In March 2004, System D's operator collects the 3rd scheduled set of 3 TTHM samples (one per plant at point of maximum residence time) for the 1st quarter, has the samples analyzed by a certified laboratory, and enters the values on the TTHM monitoring form. Since he has collected a total of (3) three distribution system samples per plant (nine samples) during the quarter, he calculates an arithmetic average value for TTHM for the system and enters it on the TTHM monitoring form. The average of all samples taken at the points of maximum residence time during the quarter is 0.063 mg/L (0.0627 rounded to 0.063 mg/L).

Table 2-28. System D 1st Quarter 2004 TTHM Monitoring Results		
Month/Quarter		**Average of Sampling Points 1, 2, and 3 (mg/L)**
January 2004/Q1		0.061
February2004/Q1		0.063
March 2004/Q1		0.065
Quarterly Average (mg/L)		0.063
Compliance Calculation	**Sum**	0.063
	÷ 4	0.01575 = 0.016
	1st Quarter RAA	0.016 < 0.080

Example #15 Decision

Since system D's operator has not completed a full year of TTHM monitoring, he must use the 1st year RAA calculation methodology for calculating a running annual (arithmetic) average. He calculates the sum of the 1st quarter average value in the distribution system (0.063 mg/L) and the assumed zeros for the other three quarters, and divides the total by 4. Since the RAA is not greater than 0.080 mg/L, System D is in compliance with the MCL for TTHM after the 1st quarter of 2004.

Public Reporting Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System D is in compliance with the TTHM MCL, the operator must routinely report the information presented in Table 2-22 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #16 - TTHM MCL 3rd Quarter RAA

Table 2-29 summarizes the TTHM monitoring results for 2004. In September 2004, System D's operator collects the 3rd scheduled set of 3 TTHM samples (one per plant at the point of maximum residence time) for the 3rd quarter of monitoring in 2004. He enters the values on the TTHM monitoring forms. Since he has collected three sets of 3 samples during the 3rd quarter, he calculates a quarterly arithmetic average concentration for the system and records that value on the TTHM monitoring forms. The quarterly average of all TTHM samples collected for the 3rd quarter is 0.140 mg/L. Assume the 2nd quarter's average is 0.125 mg/L.

Table 2-29. System D 2004 TTHM Monitoring Results		
Quarter		**Average of Sampling Points 1, 2, and 3 (mg/L)**
Q1		0.063
Q2		0.125
Q3		0.140
Compliance Calculation	**Sum**	0.328
	÷ 4	0.082
	3rd Quarter RAA	0.082 > 0.080

Example #16 Decision

Since System D's operator has not completed one full year of monitoring for TTHM, he cannot calculate a running annual arithmetic average and must use the 1st year RAA calculation methodology. He sums the three available quarterly arithmetic average values and assumes zero for the remaining quarter and divides the result by four to determine compliance with the MCL of 0.080 mg/L. The result is 0.082 mg/L. He must report an MCL violation since the sum of available quarterly average values divided by 4 is greater than the MCL of 0.080 mg/L. System D has already exceeded the TTHM MCL in the third quarter, when it was assumed that the fourth quarter value was 0 mg/L. Therefore, the system will also be out of compliance in the fourth quarter of 2004.

Public Notice Requirements

System D must provide Tier 2 public notice of this MCL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System D's operator must notify the Primacy Agency regarding the MCL violation according to the requirements of 40 CFR141.134, as summarized in Table 2-22.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED TTHM MCL violation data elements and individual DTF transactions are listed below in Exhibit 2.7. The violation begin and end dates should be reported as the quarter in which the noncompliance condition was determined (July 2004 - Sept. 2004). ***SDWIS Reporting Code 02/2950***.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	2950
C1105	Violation Type Code	02
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234570	0400001		I	C1103	2950		
D1	GA1234570	0400001		I	C1105	02		
D1	GA1234570	0400001		I	C1107	20040701		
D1	GA1234570	0400001		I	C1109	20040930		

Exhibit 2.7 TTHM MCL Violation Data Element Table and DTF Transactions

2.2 MRDL Violations

General Discussion of Maximum Residual Disinfectant Level (MRDL) Violations

The Stage 1 DBPR established MRDLs for three chemical disinfectants – chlorine, chloramines and chlorine dioxide. Disinfectants are used to control risks from microbial pathogens, but represent a subsequent health risk if present in the finished water at excessive levels. The MRDL violations are similar to MCL violations.

Table 2-30. Regulated Disinfectant MRDLs

Regulated Disinfectants	Maximum Residual Disinfectant Levels (mg/L)
Chlorine	4.0 as Cl_2
Chloramines	4.0 as Cl_2
Chlorine Dioxide	0.8

Chlorine and chloramine MRDL compliance is based on a running annual arithmetic average, computed quarterly, of the monthly average of all samples. Chlorine and chloramine residuals are measured at the same location and frequency in the distribution system as are total coliform samples required for compliance with the Total Coliform Rule.

All MRDL violations for chlorine and chloramines are considered to be non-acute. Therefore, the violation type code of 11 should be used for these violations.

For chlorine and chloramines, the beginning and ending dates of the violation should be reported as the quarter in which the monthly samples create an RAA exceeding the MRDL. No analytic result is required as part of the SDWIS report of a violation. Table 2-31 presents a summary of the MRDL Violation reporting codes.

In cases where a system switches between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted by the system must clearly indicate which residual disinfectant was analyzed for each sample.

Chlorine dioxide is monitored daily at the entrance to the distribution system. When any daily sample exceeds the MRDL, the system must take a 3-sample set from the distribution system the next day in addition to the daily entry point sample. A violation of the chlorine dioxide MRDL is defined by ANY one of the following conditions:

- Any one of the 3 distribution system samples taken in response to an entry point MRDL exceedance which also exceeds the MRDL; or
- Any two consecutive daily entry point samples exceed the MRDL (regardless of distribution system monitoring results); or
- The water system fails to perform distribution system monitoring following an entry point exceedance; or
- The water system fails to perform entry point monitoring following an entry point exceedance.

When reporting chlorine dioxide violations the compliance period should be reported for periods of 1 month. Both Compliance Period Begin Date and Compliance Period End Date must be supplied. A new numeric field, C1112, has been supplied in which to record the number of times the chlorine dioxide MRDL was exceeded during the month. The violation type code (C1105) will distinguish between an acute and nonacute chlorine dioxide MRDL violation (code 11 = nonacute, code 13 = acute).

Chlorine dioxide MRDL violations may be either acute or nonacute violations. An acute violation occurs if a daily entry point sample exceeds the MRDL and any of the 3 distribution samples collected the following day exceed the MRDL, or there is a failure to take distribution system samples following an entry point exceedance. A nonacute violation occurs if two consecutive entry point samples exceed the MRDL but none of the 3-sample set distribution samples exceed the MRDL, or the water system fails to take an entry point sample on the day following an entry point MRDL exceedance.

Table 2-31. SDWIS/FED Codes for MRDL Reporting Under the Stage 1 DBPR		
Violation Code	**Contaminant Code**	**MRDL Violations**
11	0999	Chlorine MRDL - Nonacute
	1006	Chloramines MRDL - Nonacute
	1008	Chlorine Dioxide - Nonacute
13	1008	Chlorine Dioxide - Acute

2.2.1 Type 11/0999: Chlorine MRDL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 6
Appendix D, Attachments 1, 2, 3, 4, & 5
Cross-reference to Rule:
40 CFR141.133(c)(1)

Table 2-32. Chlorine MRDL Violation		
Violation Code	**Contaminant Code**	**Violation Description**
11	0999	The running annual arithmetic average, computed quarterly, of monthly averages of all samples collected exceeds the MRDL of 4.0 mg/L (unless the increased residual levels in the distribution system are necessary to address specific microbiological contamination problems)

Example System Description - System E

System E is a small Subpart H system serving 1,800 people that uses surface water from a small river. The system treats the water with a direct filtration plant and uses chlorine as a primary and secondary disinfectant. The system utilizes one source and one treatment plant. Finished water from the plant enters the distribution system at site 1.

System E Summary

Population Served: 1,800
Source #1: River
Treatment: direct filtration, chlorine

Any Subpart H community or NTNC water system, serving less than 10,000 people (small Subpart H system) and adding a chemical disinfectant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2004. The requirements of the Stage 1 DBPR include an MRDL for chlorine, as well as the requirement to monitor for chlorine. System E's certified operator collects and analyzes grab samples for either total or free chlorine from the same locations and on the same frequency as the total coliform bacteria samples during each month of each quarter. System E's certified operator continues to take chlorine samples during times when the disinfection system is operating under normal conditions, and when the chlorine residual is increased in response to specific microbiological contamination

problems. Higher chlorine residual measurements taken while a specific microbiological problem is being addressed are included in MRDL RAA compliance calculations.

Samples are collected at the locations and according to the schedule specified in the monitoring requirements summarized in Table 2-33.

Table 2-33. System E Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine			X		X		
DBPs:							
TTHM /HAA5			X			X	

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X				X (<3,300 people served)

The certified operator records the results on a chlorine monitoring form each day that coliform samples are collected. At the end of each calendar month an average chlorine concentration is calculated for the month. At the end of each calendar quarter, he calculates an average of all monthly averages (an annual average of the previous 12 monthly averages), and compares the result to the chlorine MRDL of 4.0 mg/L. A violation of the MRDL for chlorine is defined as any running annual arithmetic average, computed quarterly, of monthly arithmetic averages that exceeds the 4.0 mg/L MRDL established for chlorine. Additionally, during the 1st full year of chlorine monitoring, at the end of each calendar quarter, System E's operator calculates the sum of the available monthly averages, and records the value on the chlorine monitoring form. During the 1st full year of chlorine monitoring, a violation of the MRDL for chlorine is defined when the sum of the available monthly averages of chlorine concentrations plus assumed zeros for samples not yet taken, divided by 12, exceeds 4.0 mg/L. Otherwise, an evaluation for system compliance with the MRDL for chlorine, using a running annual arithmetic average calculation, is 1st accomplished 12 months after the effective date of the rule. Please refer to Section 2.4.2 for a discussion of chlorine monitoring and reporting requirements and associated violations.

Example #17 - Chlorine MRDL 1st Quarter RAA

Table 2-34 summarizes the chlorine monitoring results for the 1st quarter of 2004. System E's operator collects two samples per month at the same locations as total coliform bacteria samples. On March 20, 2004, System E's operator collects and analyzes the sixth and last chlorine residual sample in the distribution system for the 1st quarter of 2004. He calculates a monthly arithmetic average of the chlorine residual values and records it on the chlorine residual monitoring form. The averages for the months of

January (2.9 mg/L), February (4.1 mg/L) and March (3.5 mg/L) of 2004 are all less than or very close to the 4.0 mg/L.

Table 2-34. System E 1st Quarter 2004 Chlorine Residual Monitoring Results

Date of Sample		Monthly Average Result (mg/L)
January 2004		2.9
February 2004		4.1
March 2004		3.5
Compliance Calculations	**Sum**	10.5
	÷ 12	0.875 = 0.88
	1st Quarter RAA	0.88 < 4.0

Example # 17 Decision

Since System E's operator has not completed one full year of monitoring for chlorine residual, an RAA chlorine concentration cannot be calculated. He calculates the sum of the monthly averages for January, February, and March, assumes zeros for months for which monitoring has not yet occurred, and divides the result by 12 in order to determine compliance. Because the result is not greater than the 4.0 mg/L MCL, the operator is not required to report a chlorine MRDL violation after the 1st quarter of 2004. At the end of March 2004, this system is in compliance with the requirements of the Stage 1 DBPR regarding the MRDL for chlorine.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System E is in compliance with the MCL for chlorine, the operator must routinely report the information summarized in Table 2-35 below to the Primacy Agency.

Table 2-35. Chlorine or Chloramines Reporting Requirement [40 CFR 141.134]

Water systems monitoring for chlorine or chloramines under the requirements of 40 CFR141.132(c)	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **Water Systems must report to the Primacy Agency:** (1) The number of samples taken during each month of the last quarter (2) The monthly arithmetic average of all samples taken in each month for the last 12 months (3) The arithmetic average of the monthly averages for the last 12 months (4) Whether, based on §141.133(c)(1) the MRDL was violated

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #18 - Chlorine MRDL 3rd Quarter

Table 2-36 summarizes the chlorine monitoring results for 2004. On September 20, 2004, System E's operator collects and analyzes the sixth 3rd quarter chlorine residual sample from the distribution system. The operator records the value on the chlorine residual monitoring form and calculates the September monthly arithmetic average and records that value on the monitoring form. Since the 3rd quarter 2004 monitoring is complete, the operator calculates the monthly arithmetic average of all samples taken during the 3rd quarter, and records those values (5.1 mg/L, 4.7, mg/L and 4.9 mg/L) on the monitoring form. The monthly average values have been ranging above the MRDL of 4.0 mg/L, so the operator suspects the system may be in violation of the chlorine MRDL.

Table 2-36. System E 3rd Quarter 2004 Chlorine Residual Monitoring Results

Date of Sample		Monthly Average Result (mg/L)
January 2004		2.9
February 2004		4.1
March 2004		3.5
April 2004		5.2
May 2004		5.1
June 2004		4.4
July 2004		5.1
August 2004		4.7
September 2004		4.9
Compliance Calculations	Sum	39.9
	÷ 12	3.3
	3rd Quarter RAA	3.3 < 4.0

Example #18 Decision

Since System E's operator has not completed one full year of monitoring for chlorine residual an RAA chlorine concentration cannot be calculated. He calculates the sum of the 1st nine monthly arithmetic average concentrations, assumes zeros for the three remaining months of the year and divides that sum by 12 in order to determine compliance. The result of 3.3 mg/L is less than the MRDL of 4.0 mg/L. Therefore, the system remains in compliance with the MRDL for chlorine after the 3rd quarter of 2004.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System E is in compliance with the chlorine MRDL, System E must routinely report the information presented in Table 2- 35 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #19 - Chlorine MRDL Full Year RAA

Table 2-37 summarizes the chlorine residual monitoring results for 2004. On December 20, 2004, System E's operator collects and analyzes the sixth quarterly chlorine residual sample and records the result on the system chlorine monitoring form. He calculates a monthly arithmetic average chlorine value for December and records it on the system monitoring form. The monthly averages for the 4th quarter of 2004 are: October (4.1 mg/L), November (3.3 mg/L) and December (2.9 mg/L).

Table 2-37. System E 4th Quarter 2004 Chlorine Residual Results

Date of Sample		Monthly Average Result (mg/L)
January 2004/Q1		2.9
February 2004/Q1		4.1
March 2004/Q1		3.5
April 2004/Q2		5.2
May 2004/Q2		5.1
June 2004/Q2		4.4
July 2004/Q3		5.1
August 2004/Q3		4.7
September 2004/Q3		4.9
October 2004/Q4		4.1
November 2004/Q4		3.3
December 2004/Q4		2.9
Compliance Calculations	**Sum**	50.2
	÷ 12	4.183 = 4.2
	4th Quarter RAA	4.2 > 4.0

Example #19 Decision

Since System E's operator has completed one year of monitoring, he must determine compliance based upon a running annual arithmetic average of monthly arithmetic average chlorine concentrations recorded during the previous 12 months. He calculates the average of the monthly averages of the previous 12 months and finds the result is 4.2 mg/L. He compares this value to the MRDL of 4.0 mg/L, and it is

greater than the MRDL. The system is in violation of the Stage 1 DBPR requirements for chlorine after the 4th quarter of 2004, because the running annual arithmetic average of monthly arithmetic average chlorine concentrations is greater than the MRDL.

Public Notice Requirements

System E must provide Tier 2 public notice of this MRDL violation according to the requirements of 40 CFR 141.201.

System Reporting Requirements

System E must routinely report the information presented in Table 2-35 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

The Appropriate SDWIS/FED chlorine MRDL violation data elements are listed below. Exhibit 2.8 Shows the data elements and individual DTF transactions. ***SDWIS Reporting Code 11/0999***.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	0999
C1105	Violation Type Code	11
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234572	0500001		I	C1103	0999		
D1	GA1234572	0500001		I	C1105	11		
D1	GA1234572	0500001		I	C1107	20041001		
D1	GA1234572	0500001		I	C1109	20041231		

Exhibit 2.8 Chlorine MRDL Violation Data Element Table and DTF Transactions

2.2.2 Type 11/1006: Chloramines MRDL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:

Section II, pages 4 and 6

Appendix D, Attachments 1, 2, 3, 4, & 5

Cross-reference to Rule:

40 CFR141.133(c)(1)

Table 2-38. Chloramines MRDL Violation		
Violation Code	**Contaminant Code**	**Violation Description**
11	1006	The running annual arithmetic average, computed quarterly, of monthly averages of all samples collected, exceeds the MRDL of 4.0 mg/L (unless increased residual levels in the distribution system are necessary to address specific microbiological contamination problems).

Example System Description - System F

System F is a large Subpart H system serving 22,000 people. The system has a microfiltration membrane plant and disinfects the water with chloramines.

System F Summary

Population Served:	22,000
Source #1:	high mountain lake
Treatment:	membrane filtration, chloramines

Any Subpart H community or NTNC water system serving more than 10,000 people (large Subpart H system), and adding a chemical disinfectant to treat water must meet the requirements of Stage 1 DBPR after January 1, 2002. The requirements of the Stage 1 DBPR include a MRDL for chloramines, as well as the requirement to monitor for chloramines. System F's certified operator collects and analyzes one grab sample for either combined or total chlorine from the same locations and on the same frequency as the total coliform bacteria samples. For this size system, the minimum number of samples allowed under the Total Coliform Rule is 25 per month, however, System F's written monitoring plan describes 36 samples per month. System F's certified operator continues to take chlorine samples during times when the disinfection system is operating under normal conditions and when the chlorine residual is increased in response to specific microbiological contamination problems. Higher chlorine concentrations measured while a specific microbiological problem is being addressed are included in the MRDL RAA compliance calculations.

Samples are collected at the locations and according to the system monitoring requirements summarized in Table 2-39. Chloramine monitoring results are reported as either total or combined chlorine, in mg/L. The operator records the results on a chloramine monitoring form each day that measurements are made, and at the end of each calendar month he calculates an average chloramine concentration by summing the individual results and dividing by the number of samples (36 in this case). The results are expressed as mg/L of chlorine. At the end of each calendar quarter, System F's operator calculates an average of monthly averages of chlorine concentrations for all samples collected and compares the result to the chloramine MRDL of 4.0 mg/L (as chlorine).

A violation of the MRDL for chloramine is defined as any running annual arithmetic average, computed quarterly, of monthly arithmetic averages of all samples collected, that exceeds the 4.0 mg/L (as chlorine) MRDL established for chloramines. During the 1st full year of monitoring the operator must use the 1st year RAA calculation methodology. At the end of each calendar quarter, the operator calculates the sum of the available monthly averages, assumes zero for the months not yet monitored, and divides the sum by 12. A violation of the MRDL for chloramines is defined when the sum of the available monthly (average) chlorine concentrations and assumed zero concentrations for the remainder of the year, divided

by 12, exceeds the MRDL of 4.0 mg/L. See Section 2 for a description of the calculation of an RAA during the first year of monitoring.

Table 2-39. System F Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

Please refer to Section 2.4.4 for a discussion of monitoring and reporting violations for chloramines.

Example #20 - Chloramines MRDL Full Year RAA in Compliance

Table 2-40 summarizes the chloramine monitoring results for 2002. On December 31st, 2002, System F's certified operator collects and analyzes the last of the December 2002 chloramine samples from the distribution system. A monthly arithmetic average chloramine concentration is calculated for the month of December 2002 using all 36 samples and that value is recorded on the monitoring form. Since the operator has completed the 4th quarter of 2002, he calculates an average of all monthly averages of the year 2002. Since the operator has completed one full year of chloramine monitoring, he must determine compliance with the MRDL for chloramines by calculating a running annual arithmetic average of the monthly arithmetic average concentrations for the previous 12 months.

Table 2-40. System F 2002 Chloramine Monitoring Results		
Date of Sample		**Monthly Average Results (mg/L)**
January 2002		3.8
February 2002		4.2
March 2002		3.3
April 2002		2.9
May 2002		3.7
June 2002		3.6
July 2002		3.9
August 2002		3.5
September 2002		3.3
October 2002		3.7
November 2002		3.4
December 2002		3.3
Compliance Calculations	**Sum**	42.6
	÷ 12	3.55 = 3.6
	4th Quarter RAA	3.6 < 4.0

Example #20 Decision

Since System F's operator has completed a full year of chloramine monitoring, he compares the running annual arithmetic average of monthly averages for the previous 12 month period (3.6 mg/L) to the MRDL established for chloramines (4.0 mg/L as chlorine). System F is in compliance with the MRDL for chloramines at the end of December 2002.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System F is in compliance with the MRDL for chloramines, it must routinely report the information presented in Table 2-35 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #21 - Chloramines MRDL Full Year RAA in Violation

Table 2-41 summarizes the System F chloramine monitoring results. On June 30, 2003, System F's certified operator collects and analyzes the last of the 36 monthly chloramine samples from the distribution system for June 2003 according to the system's monitoring plan. A monthly arithmetic average chloramine concentration expressed as mg/L of chlorine is calculated for the month of June 2003 and is recorded on the monitoring form. Since System F has completed more than one full year of chloramine monitoring, he must determine compliance with the MRDL for chloramines by calculating a running annual arithmetic average of the monthly arithmetic average concentrations for the previous 12 months. The running annual arithmetic average concentration is 4.1 mg/L (as chlorine).

Table 2-41. System F Chloramine Monitoring RAA Results

Date of Sample		Monthly average Results (mg/L)
July 2002		3.9
August 2002		3.5
September 2002		3.3
October 2002		3.7
November 2002		3.4
December 2002		3.3
January 2003		4.4
February 2003		4.6
March 2003		4.8
April 2003		4.9
May 2003		4.7
June 2003		4.7
Compliance Calculations	**Sum**	49.2
	÷ 12	4.1
	2nd Quarter RAA	4.1 > 4.0

Example #21 Decision

Since System F has completed more than a full year of chloramine monitoring, the operator compares the running annual arithmetic average for the previous 12 month period (4.1 mg/L) to the MRDL established for chloramines (4.0 mg/L). The operator must report an MRDL violation for chloramines at the end of June 2003.

Public Notice Requirements

System F must provide Tier 2 public notice of the MRDL violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System F's operator must notify the Primacy Agency regarding the MRDL violation as summarized in Table 2-35.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED chloramines MRDL violation data elements and individual DTF transactions are listed below in Exhibit 2.9. ***SDWIS Reporting Code 11/1006***.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1006
C1105	Violation Type Code	11
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be 3 months later than C1107*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234575	0300001		I	C1103	1006		
D1	GA1234575	0300001		I	C1105	11		
D1	GA1234575	0300001		I	C1107	20030401		
D1	GA1234575	0300001		I	C1109	20030630		

Exhibit 2.9 Chloramine MRDL Violation Data Element Table and DTF Transactions

2.2.3 Type 11/1008: Chlorine Dioxide MRDL Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 6
Appendix D, Attachment 6
Cross-reference to Rule:
40 CFR141.133(c)(2)

Table 2-42. Chlorine Dioxide MRDL Violations

Violation Code	Contaminant Code	Violation Description
13	1008	**Acute Violation:** When any daily sample taken at the entrance to the distribution system exceeds the MRDL of 0.8 mg/L, AND, on the following day one or more of the three samples taken in the distribution system also exceeds the MRDL of 0.8 mg/L; failure to take distribution system samples following an entry point exceedance.
11	1008	**Non-Acute Violation:** When any daily sample taken at entrance to the distribution system exceeds the MRDL of 0.8 mg/L, AND, on the following day, the daily sample taken at the entrance to the distribution system also exceeds the MRDL of 0.8 mg/L and all distribution system samples are less than or equal to the MRDL of 0.8 mg/L; failure to take entry point sample the day following an entry point exceedance.

General Discussion of Chlorine Dioxide Violations

SDWIS/FED has established C1112 as a new data element number in which to record the number of times the MRDL was exceeded during the reporting month. When reporting to SDWIS the violation type code is used to distinguish between acute and non-acute violations. Systems may incur and must report to SDWIS/FED both acute and non-acute violations during the same reporting month.

Example System Description - System AA

System AA is a large Subpart H system serving 49,000 people that uses surface water. The system has a conventional treatment plant and treats the surface water with chlorine dioxide for taste and odor control. Chlorine is added as a primary and secondary disinfectant. System AA has a booster chlorination facility in a remote location within the distribution system in order to maintain an adequate chlorine residual.

System AA Summary

Population Served:	49,000
Source #1:	Surface water
Treatment:	Conventional filtration, chlorine dioxide, chlorine

The MRDL established for chlorine dioxide in the Stage 1 DBPR is 0.8 mg/L. Compliance is based upon the results of samples taken on consecutive days. In addition, the rule specifies that an MRDL violation has occurred when a system fails to take the additional distribution system samples required on the day following a routine daily entrance sample analysis result that exceeds 0.8 mg/L chlorine dioxide, or the

routine entrance to the distribution system sample on any day following a routine daily entrance sample analysis result that exceeds 0.8mg/L chlorine dioxide.

Any Subpart H community or NTNC water system serving more than 10,000 people (large Subpart H system), and utilizing chlorine dioxide as a disinfectant or oxidant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2002. The requirements of the Stage 1 DBPR include an MRDL for chlorine dioxide, as well as the requirement to monitor daily for chlorine dioxide. System AA's certified operator collects and analyzes one grab sample daily for chlorine dioxide at the entrance to the distribution system. The routine sample is collected each day at the location and according to the monitoring requirements summarized in Table 2-43.

Table 2-43. System AA Chlorine Dioxide Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine			X		X		
Chlorine Dioxide		X		X			
			X	An additional distribution system 3- sample set must be collected the day following any exceedance of 0.8 mg/L at the entrance to the distribution system			
DBPs:							
TTHM /HAA5			X			X	
Chlorite (Daily) (grab)		X		X			
(3-sample set)			X		X		
(3-sample set)			X	A distribution system 3-sample set must be collected on the day following any daily sample that exceeds 1.0 mg/L at the entrance to the distribution system			
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as$CaCO_3$)	X				X		
SUVA*	X				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria requirement of 40 CFR 141.135

The results are recorded on a chlorine dioxide monitoring form each day, and compared to the MRDL of 0.8 mg/L. On the day following any daily routine sample result that exceeds the 0.8 mg/L MRDL, in addition to the daily routine sample, the operator must collect and analyze three chlorine dioxide samples in the distribution system. Since System AA operates a chlorine residual booster station, the operator takes three samples at the following locations: one as close as possible to the 1st customer, one in a location representative of average residence time, and one as close to the end of the distribution system as possible (representing maximum residence time). The results of this monitoring are recorded on the chlorine dioxide monitoring form and each result compared to the chlorine dioxide MRDL of 0.8 mg/L.

An acute violation of the chlorine dioxide MRDL is defined when any daily routine sample at the entrance to the distribution system exceeds the MRDL of 0.8 mg/L, and, on the following day one or more of the three additional samples taken in the distribution system exceeds the MRDL of 0.8 mg/L, or when the system fails to collect and analyze the distribution system samples the day following an entry point exceedance of the MRDL values.

A non-acute violation of the chlorine dioxide MRDL is defined when any two consecutive routine daily samples taken at the entrance to the distribution system exceed the MRDL of 0.8 mg/L, while all of the additional samples taken in the distribution system are less than the MRDL of 0.8 mg/L, or when the system fails to collect and analyze the daily sample at the entrance to the distribution system the day following and entry point exceedance. Please refer to Section 2.4.6 for a discussion of monitoring and reporting for chlorine dioxide.

Example #22 - Chlorine Dioxide MRDL Acute and Non-Acute Violation

Table 2-44 summarizes the January 2002 data for system AA.

On January 1, 2002 and on January 2, 2002, System AA's operator collects and analyzes the routine daily chlorine dioxide samples from the entrance to the distribution system. The results are both 0.7 mg/L. On January 3, 2002, the operator collects and analyzes the routine daily chlorine dioxide sample from the entrance to the distribution system. The result is 1.0 mg/L. This value, which is > 0.8 mg/L, triggers a requirement for additional distribution system samples on the following day. On January 4, 2002, he collects the routine daily entrance to the distribution system sample and then collects the three additional distribution system samples according to the monitoring plan. The routine sample on January 4, 2002 is 0.9 mg/L and the three additional samples are 0.9 mg/L, 0.8 mg/L and 0.5 mg/L. On January 5, 2002, he collects and analyzes the routine daily sample for chlorine dioxide at the entrance to the distribution system, and the three additional samples. The routine sample is 0.9 mg/L and the additional samples are 0.8 mg/L, 0.7 mg/L, and 0.5 mg/L. On January 6, 2002, he collects and analyzes the routine daily sample for chlorine dioxide at the entrance to the distribution system, and the three additional samples. The routine sample is 0.7 mg/L and the additional samples are 0.7 mg/L, 0.7 mg/L, and 0.5 mg/L. On January 7 through 28, System AA's operator collects and analyzes a routine, daily sample for chlorine dioxide, and on each day the result is less than the MRDL of 0.8 mg/L. On January 29, 2002, he collects and analyzes the routine daily sample for chlorine dioxide at the entrance to the distribution system. The result is 0.9 mg/L. On January 30, 2002, he collects and analyzes the routine daily sample for chlorine dioxide at the entrance to the distribution system, and the three additional samples. The routine sample is 0.8 mg/L and the additional samples are 0.8 mg/L, 0.7 mg/L and 0.6 mg/L. On January 31, 2002, the operator collects and analyzes the routine daily sample for chlorine dioxide at the entrance to the distribution system. The result is 0.7 mg/L.

Table 2-44. System AA January 2002 Chlorine Dioxide Monitoring Results (mg/L)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		Day 1 0.7 mg/L	Day 2 0.7 mg/L	Day 3 **1.0 mg/L**	Day 4 **0.9 mg/L** **0.9 mg/L** 0.8 mg/L 0.5 mg/L	Day 5 **0.9 mg/L** 0.8 mg/L 0.7 mg/L 0.5 mg/L
Day 6 0.7 mg/L 0.7 mg/L 0.7 mg/L 0.5 mg/L	Day 7 0.7 mg/L	Day 8 0.6 mg/L	Day 9 0.4 mg/L	Day 10 0.8 mg/L	Day 11 0.8 mg/L	Day 12 0.7 mg/L
Day 13 0.5 mg/L	Day 14 0.7 mg/L	Day 15 0.6 mg/L	Day 16 0.6 mg/L	Day 17 0.6 mg/L	Day 18 0.7 mg/L	Day 19 0.7 mg/L
Day 20 0.3 mg/L	Day 21 0.4 mg/L	Day 22 0.7 mg/L	Day 23 0.7 mg/L	Day 24 0.7 mg/L	Day 25 0.8 mg/L	Day 26 0.7 mg/L
Day 27 0.6 mg/L	Day 28 0.8 mg/L	Day 29 0.9 mg/L	Day 30 0.8 mg/L 0.8 mg/L 0.7 mg/L 0.6 mg/L	Day 31 0.7 mg/L		

Note: the values to the top left of each day's square are daily routine monitoring entrance to the distribution system results and the values to the right of the day square are additional monitoring in the distribution system, required the day following a day when any daily entrance to the distribution system routine sample exceeds the 0.8 mg/L MRDL for chlorine dioxide.

Example #22 Decision

System AA incurs one acute violation of the MRDL and one non-acute violation of the MRDL for January 2002. Since compliance with the chlorine dioxide MRDL is based upon consecutive daily samples, System AA's operator must review each day's chlorine dioxide monitoring results in conjunction with the results from the previous day. Additionally, after comparing each day's entrance to the distribution system monitoring results to the MRDL for chlorine dioxide, the operator must determine the need for appropriate additional distribution system monitoring required when the MRDL is exceeded in any daily entrance to the distribution system sample.

Compliance with the MRDL is determined against a definition of both an acute and a non-acute violation. System AA must report an acute violation of the MRDL for chlorine dioxide for January 4th, because the MRDL of 0.8 mg/L was exceeded at the entrance to the distribution system January 3, 2002 and in the additional distribution system samples (0.9 mg/L) collected on January 4, 2002. For January 5th, the operator must report a 2nd MRDL violation. However, it is defined as a non-acute violation, because only the entry point samples exceeded the MRDL on two consecutive days (January 4th and January 5th). Later in the month, on January 29, 2002, System AA's operator collects and analyzes a routine daily sample that exceeds the MRDL (0.9 mg/L). However, a violation is not defined for this date because neither the January 30, 2002 routine sample or the three additional distribution system samples for January 30, 2002 exceed the MRDL of 0.8 mg/L.

Public Notice Requirements

System AA must provide Tier 1 public notice of the acute MRDL violations incurred on January 4th, according to the requirements of 40 CFR141.201. The non-acute MRDL violation incurred on January 5th requires Tier 2 public notice.

System Reporting Requirements

System AA's operator must summarize the appropriate information for the 1st quarter of 2002 and report to the Primacy Agency within 10 days of the end of the quarter. System AA must routinely report the information in Table 2-45 to the Primacy Agency.

Table 2-45. Chlorine Dioxide Reporting Requirement [40 CFR 141.134]

Water systems monitoring for chlorine dioxide under the requirements of 40 CFR141.132(c)	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **Water systems must report to the Primacy Agency:** (1) The dates, results and locations of samples taken during the last quarter (2) Whether, based on §141.133(c)(2) the MRDL was violated (3) Whether, the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or non-acute.

Primacy Agency to SDWIS/FED Reporting

At the end of the 1st quarter of monitoring, the operator will report that during the month of January 2002, the MRDL for chlorine dioxide was violated two times in two sets of consecutive daily samples. One instance was an acute violation, ***SDWIS Reporting Code 13/1008***, while the other instance defined a non-acute violation of the MRDL. ***SDWIS Reporting Code 11/1008***

The appropriate SDWIS/FED chlorine dioxide MRDL violation data elements and individual DTF transactions for an acute and a non-acute violation are listed below in Exhibit 2.10.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1008
C1105	Violation Type Code	13
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be one month later than C1107*
C1112	Severity Indicator Count	*Number of violations*

DTF Transactions: Acute Violation

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234576	0200001		I	C1103	1008		
D1	GA1234576	0200001		I	C1105	13		
D1	GA1234576	0200001		I	C1107	20020101		
D1	GA1234576	0200001		I	C1109	20020131		
D1	GA1234576	0200001		I	C1112	1		

DTF Transactions: Non-acute Violation

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234576	0200002		I	C1103	1008		
D1	GA1234576	0200002		I	C1105	11		
D1	GA1234576	0200002		I	C1107	20020101		
D1	GA1234576	0200002		I	C1109	20020131		
D1	GA1234576	0200002		I	C1112	1		

Exhibit 2.10 Chlorine Dioxide Acute and Non-Acute MRDL Violation Data Element Table and DTF Transactions

2.3 Treatment Technique Violations

Treatment Technique violations are caused by a failure to meet TT performance requirements. Table 2-46 presents a summary of all Treatment Technique violation reporting codes for the Stage 1 DBPR.

Table 2-46. SDWIS/FED Codes for TT Reporting Under the Stage 1 DBPR

Violation Code	Contaminant Code	Treatment Technique Violations
12	0400	Failure to have qualified operator in charge after effective date of the rule
37	0400	Failure to submit/obtain Primacy Agency approval for significant treatment modifications
46	2920	Failure to meet DBP precursor removal (TOC)

2.3.1 Type 12/0400: Qualified Operator in Charge

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page 4 & 8
Section IV-D, page 37
Cross-reference to Rule:
40 CFR141.130(c)

Table 2-47. Qualified Operator TT Violation

Violation Code	Contaminant Code	Violation Description
12	0400	Failure to have a State-approved and listed qualified operator running the plant.

Example System Description - System BB

System BB is a large Subpart H system serving 12,000 people that uses surface water that has a direct filtration plant. Chlorine is used as a primary and secondary disinfectant. The system has only one source and one plant.

System BB Summary

Population Served:	12,000
Source:	Surface water
Treatment:	Direct filtration, chlorine

Any Subpart H community or NTNCWS serving 10,000 or more people (large Subpart H system), and utilizing chlorine as a disinfectant or oxidant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2002. Requirements of the Stage 1 DBPR include a Treatment Technique requirement that the system be operated under the control of a qualified operator who is included in a Primacy Agency register of qualified operators.

Example #23 - Qualified Operator (TT)

On July 1, 2002, System BB's qualified operator terminates his employment, and System BB immediately hires another person to operate the water treatment plant. On the date of the employment, the new person is not a certified operator, and therefore is not included on the Primacy Agency register of qualified operators. On September 30, 2002, during a sanitary survey, the surveyor becomes aware that the operator is not a qualified operator. The surveyor immediately notifies the Primacy Agency.

Example #23 Decision

Since System BB's new operator is not a certified operator at the end of the 3rd quarter of 2002, and since he is not included on a Primacy Agency register of qualified operators, System BB is in violation of the Stage 1 DBPR.

Public Notice Requirements

System BB must provide, at the discretion and direction of the Primacy Agency, public notice of the TT violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

There are no specific system reporting requirements for this violation.

Primacy Agency to SDWIS/FED Reporting

System BB is considered out of compliance from July 1, 2002 until the date on which a qualified operator is in charge of the treatment system. Since this date may not be known at the time the Primacy Agency submits the violation to EPA, the SDWIS/FED data system will default the compliance period end date to December 31, 2015. When the water system meets the requirements of having a certified operator in charge of the facility, the Primacy Agency should submit a "return to compliance" enforcement action entry to SDWIS/FED and link it to the violation. The enforcement action return to compliance date shall be either the date the Primacy Agency becomes aware of the certified operator, or the date on which the certified operator became in charge of system operations. When this enforcement action is posted to the database and linked to the violation, this returned to compliance date replaces the SDWIS/FED default violation end date. ***SDWIS Reporting Code 12/0400***.

The appropriate SDWIS/FED TT violation data elements and individual DTF transactions are presented in Exhibit 2-11.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	0400
C1105	Violation Type Code	12
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*SDWIS/FED will default to 20151231*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234578	0200001		I	C1103	0400		
D1	GA1234578	0200001		I	C1105	12		
D1	GA1234578	0200001		I	C1107	20020701		

Exhibit 2.11 Qualified Operator TT Violation Data Element Table and DTF Transactions

2.3.2 Type 37/0400: Unapproved Treatment Modifications TT Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page 4 & 8
Cross-reference to Rule:
40 CFR141.30(f) (Sunsets with effective date of Stage 1 rule)

General Discussion of Treatment Modifications TT Violations

The TT criteria of the Total Trihalomethane Rule applicable to Subpart H CWSs that add a chemical disinfectant to the water in any part of the drinking water treatment process, require that prior to implementation of treatment modifications each system must submit a plan detailing such modifications to the Primacy Agency for review and approval (40 CFR 141.30(f)). These requirements also apply until January 1, 2004 to ground water systems serving a population of 10,000 or more.

Community water systems using only ground water, serving 10,000 or more people and adding a chemical disinfectant or oxidant to treat water are not required to meet the Stage 1 DBPR until January 1, 2004. However, these systems must meet the requirements of 40 CFR141.30 (a) - (g) until that date pursuant to 40 CFR141.30(h). The 1979 TTHM Rule was amended to include a treatment technique requirement that, prior to implementation of significant treatment process modifications to comply with the MCL for TTHM, each system must submit a plan detailing the modifications to the Primacy Agency for review and approval prior to implementation (40 CFR141.30(f)). Therefore, a system's certified operator must prepare a treatment system modification plan (STPM), including the elements outlined in 40 CFR141.30 (f)(1) through (f)(5), submit it to the Primacy Agency, and the system must receive

approval of the plan from the Primacy Agency, all prior to implementing the treatment plant modifications. These requirements are intended to ensure that microbial protection continues in a water system during the time the system is making any treatment process changes necessary to comply with the new requirements of the Stage 1 DBPR.

Example System Description - System CC

System CC is a ground water system serving 19,300 people. The ground water sources are treated only by addition of chlorine. All wells are connected by a manifold and treated with a single chlorination plant.

System CC Summary

Population Served:	19,300
Source:	Groundwater
Treatment:	Chlorine

Example #24 - Significant Treatment Process Modification Plan (TT)

On September 10, 2002, System CC submits a plan to the Primacy Agency detailing modifications to its disinfection process intended to improve control of their delivery of disinfectant, and to allow more precise measurement of residual disinfectant. The plan contains all the elements described in 40 CFR141.30 (f). On September 20, 2002, without receiving approval of the plan from the Primacy Agency, contractors for System CC begin construction necessary to implement the plan.

Example #24 Decision

Although System CC appropriately prepared the necessary significant treatment plant modification plan, it has committed a TT violation as a result of the system's initiation of construction of significant treatment process modifications without receiving approval from the Primacy Agency. The compliance period begin date is either the date the unapproved construction began (if known) or the date the Primacy Agency learns that the unapproved construction has begun. The compliance period end date is the date on which the Primacy Agency notifies the system that the modification plan is approved. If the date of modification plan approval is unknown at the end of a reporting period, then the compliance period end date will be defaulted to December 31, 2015 (20151231) by SDWIS/FED. When the Primacy Agency approves the plan it should report that actual compliance period and date to SDWIS/FED by using a link to a "return to compliance" enforcement action.

Public Notice Requirements

System CC must provide, at the discretion and direction of the Primacy Agency, public notice of this TT violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

There are no specific system reporting requirements for this violation.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED Treatment Technique violation data elements and individual DTF transactions for a failure to receive approval of a STPM plan prior to initiation of construction are listed below in Exhibit 2.12. ***SDWIS Reporting Code 37/0400***

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	0400
C1105	Violation Type Code	37
C1107	Compliance Period Begin Date	*Actual or date Primacy Agency aware*
C1109	Compliance Period End Date	*SDWIS/FED will default to December 31, 2015*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234578	0200001		I	C1103	0400		
D1	GA1234578	0200001		I	C1105	37		
D1	GA1234578	0200001		I	C1107	20020920		

Exhibit 2.12 Significant Treatment Plant Modification TT Violation Data Element Table and DTF Transactions

2.3.3 Type 46/2920: DBP Precursors Removal TT Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 8
Section IV-D, page 28
Appendix D, Attachment 8
Cross-reference to Rule:
40 CFR141.133(d)

Table 2-48. DBPP Removal Treatment Technique Violation

Violation Code	Contaminant Code	Violation Description
46	2920	A failure to meet the Treatment Technique requirements for DBP Precursor Removals. (Compliance determined quarterly)

Example System Description - System DD

System DD is a large Subpart H system serving 109,000 people that uses surface water. It uses a conventional filtration treatment plant as defined in 40 CFR141.2, including softening. The system supplies water treated with chlorine on a routine basis. The system utilizes the single source and plant 1.

System DD Summary

Population Served:	109,000
Source #1:	Surface water
Treatment #1:	Conventional filtration, chlorine, softening

Any Subpart H community water system, serving 10,000 or more people (large Subpart H system), and utilizing a chemical disinfectant or oxidant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2002. The requirements of the Stage 1 DBPR include a Treatment Technique (TT) requirement for control of disinfection byproduct precursors (DBPP). The TT requirements are applicable to Subpart H CWSs & NTNCWSs that use conventional filtration. The TT requires that each treatment plant monitor for TOC in the source water and the treated water (paired TOC samples) and for alkalinity in the source water. Table 2-49 presents a summary of system DD's monitoring requirements.

Table 2-49. System DD's Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X (raw)				X		
Treated Water Alkalinity*	X				X		
SUVA*	X				X		
Magnesium Hardness* (as $CaCO_3$)	X raw &treated				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria of 40 CFR141.135

Subpart H (systems using surface water or GWUDI sources) water systems that use conventional treatment are required under the Stage 1 DBPR to remove a percentage of the natural organic material (referred to as total organic carbon or "TOC") from the raw water. TOC is a precursor to DBP. TOC and the disinfectants used in drinking water treatment can combine to form disinfection byproducts (DBPs). The necessary TOC removal percentage (called Step 1 compliance) is based upon raw water (or source water) TOC and alkalinity concentrations (see 40 CFR141.135). A pair of TOC samples must be taken simultaneously in the raw (source) water and no later than the combined filter effluent (treated water) at least once per month to allow calculation of system percent TOC removal and to demonstrate compliance with an RAA. If any TOC data are missing, the RAA is calculated using the available data. Alternative compliance criteria are also provided to demonstrate compliance using a system's source water or treated water TOC expressed as RAA, TTHM and HAA5 RAA levels, a system's source (raw) and finished (treated) water SUVA levels, or the results of bench or pilot-scale testing.

TOC percent removal is calculated by dividing the concentration of TOC in mg/L in the treated water by the TOC concentration in the raw water. Next, subtract that value from 1 and multiply the result by 100. Finally, compliance with this TT requirement is determined by dividing the actual TOC percent removal by the required TOC percent removal found in the table in 40 CFR141.135(b)(2). When this value is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

System DD's certified operator begins collecting and analyzing paired TOC and alkalinity data on January 1, 2001 (12 months before the January 1, 2002 effective date of the rule) on a monthly frequency at the plant. This monitoring is suggested to demonstrate compliance with the treatment process TOC percent removal stated in the Step 1 TOC Removal Requirement as shown in Table 2-50. If a system fails to meet the Step 1 TOC removal requirements, the system must apply to the Primacy Agency for retroactive approval of alternative minimum TOC (Step 2) removal requirements, described in 40CRF141.135(a)(2) or (a)(3). If the system elects not to complete this monitoring during the 12 months prior to the effective date of the rule, then the system cannot be granted retroactive approval of Step 2 during 2002.

Table 2-50. Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Subpart H Systems Using Conventional Treatment

Source-water TOC (mg/L)	Source-water alkalinity, mg/L as $CaCO_3$		
	0 - 60	**> 60 - 120**	**> 120**
> 2.0 - 4.0	35.0 %	25.0 %	15.0 %
> 4.0 - 8.0	45.0 %	35.0 %	25.0 %
> 8.0	50.0 %	40.0 %	30.0 %

Example #25 - TT (DBPP Reduction) System Meets Alternative Compliance Criteria

Table 2-51 summarizes the source and treated water TOC monitoring results for 2001. On the 15th of each month, starting with January 15, 2001 and through December 15, 2001, System DD's certified operator collects and a State-approved laboratory analyzes paired samples for TOC, and a source water alkalinity sample, and records the results on a DBPP monitoring form. Monthly samples are collected according to the system monitoring plan and at times representative of normal operating conditions and normal influent water quality. Each month, the treatment process TOC percent removal is calculated.

System DD's paired TOC monitoring data for 2001 (the 12 months previous to the effective date of the rule) are displayed in Table 2-51 below.

Table 2-51. System DD 2001 Source and Treated Water TOC Monitoring Results

Source Water (mg/L)												
JAN	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**AVG.**
1.3	1.4	1.5	1.6	2.1	2.2	2.4	1.3	1.9	1.9	1.7	1.5	**RAA 1.7**
RAA = (1.3 + 1.4 + 1.5 + 1.6 + 2.1 + 2.2 +2.4 + 1.3 + 1.9 + 1.9 + 1.7 + 1.5)/12 = 1.7												
Treated Water (mg/L)												
1.2	1.2	1.3	1.6	1.9	2.0	2.2	1.3	1.8	1.9	1.6	1.4	**RAA 1.6**
RAA = (1.2 + 1.2 + 1.3 + 1.6 + 1.9 + 2.0 + 2.2 + 1.3 + 1.8 + 1.9 + 1.6 + 1.4)/12 = 1.6												

RAA = Running Annual Arithmetic Average of monthly averages

Example #25 Decision

Since the source water TOC concentration for the 12 months prior to the effective date of the rule is less than 2.0 mg/L calculated as an RAA of monthly values, System DD believes it will be in compliance with the TT requirement for DBPP (the alternative compliance criteria found in 40 CFR141.135 (a)(2)(i)). System DD must continue to comply with the monitoring requirements found in 40 CFR141.132(d) (monthly paired TOC and source water alkalinity samples).

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System DD is in compliance with the Stage 1 DBPR for TOC, the system must routinely report the information included in Table 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #26 - TT (DBPP Reduction) Failure to Meet Alternative Compliance Criteria

Table 2-52 summarizes source and treated water TOC monitoring results for 2002. On the 15th of December 2002, System DD's operator collects and has a State-approved laboratory analyze the December 2002 monthly paired TOC samples, and the source water alkalinity sample, taken at the same time, and she records the results on the DBPP monitoring form. Since the 1st year following the effective date of the rule is completed, and since the 4th quarter of 2002 is completed, the running annual arithmetic average of monthly average values for source water TOC and treated water TOC is calculated.

Monthly TOC removal percentages are calculated and the calculated removal for each month is divided by the required percent removal dictated by the rule in 40 CFR141.135 (b)(2). The results are recorded on the DBPP monitoring form. If this value is less than 1.00, system DD is not in compliance with the TOC percent removal requirement.

Table 2-52. System DD 2002 Source and Treated Water TOC Monitoring Results

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	AVG.
Source Water TOC (mg/L)												
1.1	1.4	1.4	1.8	5.0	7.1	7.0	5.2	4.8	3.0	1.8	1.1	**RAA 3.4**
Treated Water TOC (mg/L)												
1.1	1.2	1.3	1.6	3.0	4.0	4.0	3.0	2.8	2.2	1.6	1.0	**RAA 2.2**
Source Water Alkalinity (mg/L)												
98.0	95.0	85.0	80.0	88.0	90.0	93.0	94.0	95.0	100.0	98.0	91.0	**92.2**
Calculated TOC Percent Removal (1 - (treated water TOC / source water TOC)) x 100												
0	14	7	11	40	44	43	42	42	27	11	9	--
Required TOC Percent Removal (see Table 2-50)												
NA	NA	NA	NA	35	35	35	35	35	25	NA	NA	--
Ratio: Calculated TOC / Required TOC												
NA	NA	NA	NA	1.1	1.3	1.2	1.2	1.2	1.1	NA	NA	--

RAA = Running Annual Arithmetic Average
NA = Not Applicable, because the system opted for an alternate compliance criterion for that month.

Example #26 Decision

Since neither the source water TOC average concentration nor the treated water TOC average concentration for the first 12 months after the effective date of the rule (January 1, 2002) is less than 2.0 mg/L calculated as a running annual arithmetic average, System DD is not in compliance with the alternative compliance criterion found in 40 CFR141.135 (a)(2)(i) or (ii). Although the first year (2002) data may meet the alternative compliance criteria in 40 CFR141.135()(2)(iii), since the source water TOC level is an RAA less than 4.0 mg/L and the source water alkalinity RAA is greater than 60 mg/L (as $CaCO_3$), for the purposes of this example, please assume that the data is not available to comply with any of the alternative compliance criteria in 40 CFR141.135(a)(2)(iv through vi). System DD must determine compliance based upon the minimum Step 1 percent removals specified in 40 CFR141.135(b)(2). Based upon the data above (the Ratio of Calculated TOC Removal to Required TOC Removal) System DD is complying with the minimum Step 1 percent removals specified in 40 CFR141.135(b)(2) since that ratio is greater than 1.0 in each month calculated (May 2002 through October 2002)

Public Notice Requirement

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

System DD must routinely report the following information in Table 2-53 to the Primacy Agency.

Table 2-53. System DD DBPR Removal (TT) Reporting Requirements [40 CFR 141.134]

Water systems monitoring monthly or quarterly for TOC under the requirements of 40 CFR141.132 (d) and required to meet the enhanced coagulation or enhanced softening requirements in 141.135(b)(2) or (3).	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **Water systems must report to the Primacy Agency:** (1) The number of paired samples taken during the last quarter (2) The location, date and result of each paired sample and associated alkalinity taken during the last quarter. (3) For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. (4) Calculations for determining compliance with the TOC percent removal requirements, as provided in 141.135(c)(1). (5) Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in 141.135(b) for the last four quarters.
Water systems monitoring monthly or quarterly for TOC under the requirements of 40 CFR141.132 (d) and meeting one or more of the alternative compliance criteria in 40 CFR 141.135(a)(2) or (3).	Systems required to sample quarterly or more frequently must report to the Primacy Agency within 10 days after the end of each quarter in which samples are collected. **Water systems must report to the Primacy Agency:** (1) The alternative compliance criterion that the system is using (2) The number of paired samples taken during the last quarter (3) The location, date and result of each paired sample and associated alkalinity taken during the last quarter (4) The RAA based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in 40 CFR 141.135(a)(2)(i) or (iii) or of treated water TOC for systems meeting the criterion in 40 CFR141.135(a)(2)(ii) (5) The RAA based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in 40 CFR141.135(a)(2)(v) or of treated water SUVA for systems meeting the criterion in 40 CFR141.135(a)(2)(vi) (6) The RAA of source water alkalinity for systems meeting the criterion in 40 CFR141.135(a)(2)(iii) and of treated water alkalinity for systems meeting the criterion in 40 CFR141.135(a)(3)(i) (7) The RAA for both TTHM and HAA5 for systems meeting the criterion in 40 CFR141.135(a)(2)(iii)or (iv) (8) The RAA of the amount of magnesium hardness removal (as $CaCO_3$, in mg/L)for systems meeting the criterion in 40 CFR141.135(a)(3)(ii) (9) Whether the system is in compliance with the particular alternative compliance criterion in 40 CFR141.135(a)(2) or (3)

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.4 Monitoring & Reporting Violations

M&R violations are reported for water systems failing to prepare monitoring plans, submit monitoring plans as required, monitor the required parameters for the required number of samples, or report the results of monitoring for the required number of samples. Table 2-54 presents a summary of all M&R violation reporting codes.

Table 2-54. SDWIS/FED Codes for Federal Reporting Under the Stage 1 DBPR

Violation Code	Contaminant Code	Monitoring and Reporting Violations
27[1]	0400	Major: Failure to develop, implement, or submit monitoring plan
	1011	Major: Failure to collect and report 100% of required bromate samples
	2920	Major: Failure to collect source and finished water TOC/alkalinity samples
	appropriate MCL/MRDL contaminant code	Major: Failure to collect and report at least 90% of required samples (except for bromate)
		Minor: Collecting and reporting between 90-99% of required samples (except for bromate)

[1] A SDWIS field is used to distinguish between major or minor for M&R violations where appropriate

2.4.1 Type 27/0400: Monitoring Plan Development and Submittal M&R Violation

General Comments Regarding SDWIS/FED Reporting

When reporting to SDWIS/FED, the compliance period begin date to be reported for PWSs that incur this type of violation depends upon which monitoring plan provision was violated. For PWS's that fail to develop and implement the plan, the compliance period begin date should be either January 31, 2002 for large Subpart H systems (serving at least 10,000 people) or January 31, 2004 for smaller Subpart H systems (serving fewer than 10,000 people) and all ground water systems.

When water systems have developed and implemented the monitoring plan, but failed to submit the monitoring plan to the Primacy Agency by the time the first report is due to the Primacy Agency, the compliance period date will be April 10, 2002 for Subpart H systems serving at least 10,000 people, or April 10, 2004 for subpart H systems serving between 3,301 and 9,999 people.

A water system is considered out of compliance until the Primacy Agency is satisfied that the PWS has met the requirements of these provisions. Since the date when the PWS regains compliance may not be known at the time the Primacy Agency must report to SDWIS/FED, the SDWIS/FED data system has been designed to default the compliance period date of the violation to a date in the future (December 31, 2015). When the water system regains compliance with these requirements, the Primacy agency must submit a "returned to compliance" enforcement action, and link it to the original violation. The enforcement action date shall be when the Primacy Agency is satisfied with the PWS monitoring plan or when the Primacy Agency receives the monitoring plan. When this enforcement action is posted to the SDWIS/FED database and linked to the violation, the actual date of compliance replaces the default compliance period end date supplied with the original report to SDWIS/FED.

2.4.1.1 Failure to Develop Monitoring Plan within 30 days of Compliance Date M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 9
Section IV-D, page 34
Cross-reference to Rule:
40 CFR141.132(a)(3) & (f)

Table 2-55. Monitoring Plan Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	0400	A failure to develop a monitoring plan within 30 days of the initial rule compliance date.

Example System Description - System EE

System EE is a small community water system serving 3,000 people that uses only ground water determined not to be under the influence of surface water. The system supplies water treated with chlorine on a routine basis. The system utilizes one disinfection plant from which water enters the distribution system.

System EE Summary

Population Served:	3,000
Source:	Groundwater (not under the influence)
Treatment:	Chlorine

Any community water system serving less than 10,000 people and utilizing a chemical disinfectant or oxidant to treat water must meet the requirements of Stage 1 DBPR beginning January 1, 2004. Provisions of the Stage 1 DBPR require systems to prepare a monitoring plan. System EE's certified operator must prepare a plan including at least the elements contained in 40 CFR141.132(f). She must prepare the plan within 30 days of the effective date of the rule for the system as described in 40 CFR141.130(b). According to 40 CFR141.130(b)(1) the effective date of the rule for System EE is January 1, 2004. The monitoring plan must be completed by January 31, 2004.

Example #27 - M&R Monitoring Plan Compliance by System

On December 31, 2003, System EE's operator completes the monitoring plan and includes all of the elements described in 40 CFR141.132(f). Table 2- 56 summarizes System EE's monitoring requirements.

Table 2-56. System EE Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X				X[1]

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X				X (≤ 3,300 and not a Subpart H system)

[1] Sample must be collected during the warmest month of the year.

The operator places a copy of the monitoring plan on file in the treatment plant and at the system offices, for inspection by the public and the Primacy Agency. On January 1, 2004, the operator begins to monitor in accordance with the plan. On March 31, 2004, at the end of the 1st quarter of 2004, the records show that the appropriate data for all samples required under the terms of the monitoring plan have been collected, analyzed and recorded. Compliance is calculated based upon the requirements of the monitoring plan and the appropriate information is submitted to the Primacy Agency on April 10, 2004.

Example #27 Decision

System EE is in compliance with the provisions of the Stage 1 DBPR regarding monitoring plans because the operator prepared and implemented the plan prior to January 31, 2004. Since System EE serves less than 3,300 people and is not a Subpart H system, and since the Primacy Agency has not directed the system to do so, the operator is not required to submit a copy of the monitoring plan to the Primacy Agency.

Public Notice Requirement

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirement

Although System EE is in compliance with the Stage 1 DBPR regarding monitoring plans, the system must routinely report the information included in Table 2-35 to the Primacy Agency. Please refer to 40 CFR 141.134 for TTHM / HAA5 reporting requirements.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.4.1.2 Failure to Submit Monitoring Plan to Primacy Agency M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, page 4 & 9
Section IV-D, page 34
Cross-reference to Rule:
40 CFR141.132(f)

Table 2-57. Monitoring Plan - Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	0400	For Subpart H systems serving more than 3,300 people, a failure to submit a copy of monitoring plan to Primacy Agency no later than the date of the 1st report required under 40 CFR141.134.

Example System Description - System FF

System FF Summary

Population Served:	100,000
Source #1:	Surface water
Treatment #1:	Conventional filtration, chlorine
Source #2:	Groundwater under the direct influence
Treatment:	Membrane filtration, chlorine

System FF is a large Subpart H community water system serving 100,000 people that uses surface water and ground water under the direct influence of surface water. The surface water source is treated with a conventional filtration plant and the GWUDI source is membrane filtered. All sources are disinfected with chlorine. The system is required to monitor according to 40 CFR141.130. The system utilizes two plants known as TP 1 and TP 2.

Any system required to monitor under the provisions of the Stage 1 DBPR is required to develop and implement a monitoring plan. System FF's certified operator must prepare a plan including at least the elements contained in 40 CFR141.132(f). He must prepare the system's monitoring plan within 30 days of the effective date of the rule as described in 40 CFR141.130(b). According to 40 CFR141.130(b)(1) the effective date of the rule for System FF is January 1, 2002. The monitoring plan must be completed no later than January 31, 2002.

Example #28 - Failure to Submit a Monitoring Plan

On December 31, 2001, System FF's operator completes the monitoring plan and includes all of the elements described in 40 CFR141.132(f). A copy is placed on file at the treatment plant and at the system offices, for inspection by the public and the Primacy Agency. On January 1, 2002, he begins to

monitor in accordance with the plan. Table 2-58 summarizes System FF's monitoring requirements. On March 31, 2002, at the end of the 1st quarter of 2002, the records show that he has collected, analyzed and recorded the appropriate data for all samples required under the terms of the monitoring plan. He calculates compliance based upon the requirements of the monitoring plan and submits the appropriate compliance information to the Primacy Agency within 10 days after the end of the quarter (April 10, 2002). However, System FF does not submit their monitoring plan to the Primacy Agency along with the report submitted by April 10, 2002.

Table 2-58. System FF Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	
DBP Precursors							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA*	X				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

*Optional - Alternative compliance criteria of 40 CFR 141.135

Example #28 Decision

System FF is in violation of the Stage 1 DBPR for failing to submit its monitoring plan to the Primacy Agency by April 10, 2002, even though the plan was prepared and implemented properly. Subsequently, the Primacy Agency receives the monitoring plan on July 1, 2002.

Public Notice Requirements

40 CFR141.201 does not require that System FF provide public notice of this violation. Primacy Agencies may require Tier 3 public notice at their discretion.

System Reporting Requirements

There are no system reporting requirements for this parameter in this situation.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED Monitoring Plan M&R violation data elements and DTF transactions are listed below in Exhibit 2.13. ***SDWIS Reporting Code: 27/0400.***

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant code	0400
C1105	Violation Type code	27
C1107	Compliance Period Begin Date	
C1201	Enforcement ID	*Qualifier 2*
C1203	Enforcement Date	
C1205	Follow-up Action	*SOX (State Action- compliance achieved)*
Y5000	Associated Violation ID	*Violation ID*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0200005		I	C1103	0400		
D1	GA1234579	0200005		I	C1105	27		
D1	GA1234579	0200005		I	C1107	20020410		
E1	GA1234579	0200001		I	C1203	20020701		
E1	GA1234579	0200001		I	C1205	SOX		
E1	GA1234579	0200001		I	Y5000	0200005		

Exhibit 2.13 Monitoring Plan Monitoring and Reporting Violation and RTC Data Element Table and DTF Transactions

2.4.2 Type 27/0999: Chlorine Monitoring and Reporting Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 10
Section IV-D, page 19
Appendix D, Attachments 1-5
Cross-reference to Rule:
40 CFR141.132(c)(1)

Table 2-59. Chlorine Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	0999	**Major**: A failure to collect, analyze and report 90% of the required samples **Minor**: Collecting, analyzing and reporting 90% to 99% of the required samples

General Discussion of Chlorine M&R Violations

Violations are characterized as either Major or Minor. A major chlorine monitoring violation occurs when there is a failure to collect and report at least 90% of the required chlorine samples. A minor monitoring and reporting violation is incurred by a system that does not collect and report 100% of the required samples, however, it does collect and report between 90% and 99% of the required chlorine samples. Primacy Agencies report chlorine M&R violations to SDWIS on a quarterly basis. The violation begin date is entered as the 1st day of the quarter in which one or more samples are missed and the violation end date recorded as the last day of the quarter in which those samples are missed.

Example System Description - System G

System G is a large Subpart H community water system using surface water and serving 12,500 people that uses a conventional filtration plant and disinfects with chlorine. System G has only the one plant and source. Under the continuing provisions of the Total Coliform Rule, System G is required to take at least 10 total coliform samples per month in its distribution system in compliance with an approved coliform sample siting plan.

System G Summary

Population Served:	12,500
Source:	Surface water
Treatment:	Conventional filtration, chlorine

Any Subpart H system serving 10,000 or more people adding a chemical disinfectant (e.g., chlorine) must comply with the provisions of the Stage 1 DBPR on January 1, 2002. The Stage 1 DBPR requires systems to monitor for chlorine residual at each location in the distribution system and at the same frequency as total coliform monitoring. System G's certified operator collects and analyzes at least ten samples per month at locations and times described in the system's monitoring plan. Table 2-60 is a summary of System G's monitoring requirements.

Table 2-60. System G Monitoring Summary							
PARAMETER OR TASK	**SAMPLE LOCATION**			**SAMPLE FREQUENCY**			
	Plant	**Entrance to Distribution System**	**Distribution System**	**Daily**	**Monthly**	**Quarterly**	**Annually or less than annually**
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as$CaCO_3$)	X				X		
SUVA*	X				X		

Monitoring Plan REQUIRED	YES	NO	**SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE**	YES	NO
	X			X	

* Optional - Altemative compliance criteria of 40 CFR141.135

Example #29 - M&R for Chlorine Major Violation

On March 31, 2002, System G's operator reviews the chlorine monitoring data for the 1st quarter of 2002 and finds that only 21 of the required 30 samples for chlorine were collected during the quarter. Since the only issue is the number of samples collected, no data table is provided for this example.

Example #29 Decision

System G's operator has collected 21 of 30, (21 ÷ 31 x 100 = 70) or 70%, of the required chlorine samples during the 1st quarter of 2002. This failure is a Major Monitoring & Reporting violation. A system incurs a major M&R violation for the chlorine MRDL when it fails to collect, analyze and report at least 90% of the required chlorine samples in any quarter.

Public Notice Requirements

System G must provide Tier 3 public notice of the M&R violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System G must routinely report the information summarized in Tables 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED chlorine M&R violation data elements and DTF transactions are listed below in Exhibit 2.14. ***SDWIS Reporting Code 27/0999 flag Major* (Y)**.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	0999
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be three months later than C1107*
C1131	Major Violation Flag	*Y or N (Major (Y) is defined as reporting < 90% of required samples, Minor (N) as any other failure to report, such as failure to measure chlorine in a total coliform sample)*

DTF Transactions:

Exhibit 2.14 Chlorine Major Monitoring Violation Data Element Table and DTF Transactions

Example #30 - M&R for Chlorine Minor Violation

On June 30, 2002, System G's operator reviews the chlorine monitoring data for the 2nd quarter of 2002. He finds that he has collected 27 of the necessary 30 chlorine samples for the 2nd quarter. Since the only issue is the number of samples collected, no data table is provided for this example.

Example #30 Decision

System G's operator has collected 27 of 30, (27 ÷ 30 x 100 = 90) or 90%, of the required chlorine samples during the 2nd quarter of 2002. This is a Minor Monitoring & Reporting violation. A minor M&R violation for the chlorine MRDL occurs when a system collects, analyzes and reports between 90 - 99% of the required chlorine samples in any quarter, but not all or 100% of the required samples.

Public Notice Requirements

System G must provide Tier 3 public notice of the M&R violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System G must routinely report the information summarized in Tables 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

M&R violations are reported for water systems failing to monitor for (or report the results of monitoring for) the required number of samples. The appropriate SDWIS/FED chlorine M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.15. ***SDWIS Reporting Code 27/0999 flag Minor* (N)**.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	0999
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be three months later than C1107*
C1131	Major Violation Flag	*Y or N (Major (Y) is defined as reporting < 90% of required samples, Minor (N) as any other failure to report, such as failure to measure chlorine in a total coliform sample)*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0200002		I	C1103	0999		
D1	GA1234579	0200002		I	C1105	27		
D1	GA1234579	0200002		I	C1107	20020401		
D1	GA1234579	0200002		I	C1109	20020630		
D1	GA1234579	0200002		I	C1131	N		

Exhibit 2.15 Chlorine Minor Monitoring Violation Data Element Table and DTF Transactions

Example #31 - M&R for Chlorine Compliance by the System

On September 30, 2002, System G's operator reviews the chlorine monitoring data for the 3rd quarter of 2002. All of the required chlorine monitoring samples for the 3rd quarter of 2002 have been collected. Since the only issue is the number of samples collected, no data table is provided for this example.

Example #31 Decision

System G's operator has collected 100% of the required chlorine samples during the 3rd quarter of 2002. System G is in compliance with the Stage 1 DBPR monitoring and reporting requirements for chlorine for the 3rd quarter of 2002.

Public Notice Requirement

Because the system is in compliance, no public notice s required for this parameter for this reporting period.

System Reporting Requirement

Although system G is in compliance with the Stage 1 DBPR for chlorine, the system must routinely report the information included in Tables 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency To SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.4.3 Type 27/1011: Bromate M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 10
Section IV-D, page 26
Appendix D, Attachment 7
Cross-reference to Rule:
40 CFR141.132 (b)(3)

Table 2-61. Bromate Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	1011	A failure to collect and report 100% of the required samples

Example System Description - System H

System H is a small Subpart H community water system serving 4,700 people that uses surface water and treats with a softening plant. Both ozone and chlorine are used as disinfectants. System H utilizes one plant and one source. System H wishes to qualify for a reduced bromate monitoring schedule, reducing monitoring from once monthly at the entry point to the distribution system to once quarterly at the entry point to the distribution system from the ozone plant.

System H Summary

Population Served:	4,700
Source:	Surface water
Treatment:	Softening plant, ozone, chlorine

The Stage 1 DBPR provisions are effective for System H on January 1, 2004. The Stage 1 DBPR includes a requirement for all systems using ozone to monitor for bromate at the entrance to the distribution system from each ozone plant. System H's certified operator collects one sample from the entrance to the distribution system on a monthly frequency, according to the system's bromate monitoring requirements, which are summarized in Table 2-62.

Table 2-62. System H Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	
Bromate		X			X		
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA*	X				X		
Magnesium Hardness* (as $CaCO_3$)	X (raw & treated)				X		
Bromide**	X (source)				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria of 40 CFR141.135

** Optional to qualify for reduced monitoring for bromate

The Stage 1 DBPR also includes an option to monitor bromide in source water as a condition of reduced bromate monitoring. Since System H wishes to qualify for a reduced bromate monitoring frequency, the certified operator collects and analyzes one sample for bromide from the source water on a monthly frequency, according to the requirements of the system's monitoring plan. He records the results of both analytical procedures on the bromate / bromide monitoring form and after one year of monthly monitoring for both bromate and bromide, calculates an annual arithmetic source water bromide concentration and compares it to 0.05 mg/L. If the annual average source water bromide concentration is less than 0.05 mg/L, then the operator may reduce the once monthly bromate monitoring schedule to once per quarter at the entrance to the distribution system. The operator must continue to collect and analyze one monthly source water sample for bromide, and must maintain a running annual source water bromide concentration, calculated on a quarterly basis, that is <0.05 mg/L to retain the reduced bromate monitoring schedule.

General Discussion of Bromide Monitoring

A failure to monitor for bromide is not a violation of the Stage 1 DBPR. Bromide monitoring is only required as a pre-requisite to a reduced monitoring schedule for bromate. The consequence of a failure to monitor for bromide at the location(s) and on the frequency necessary to justify a reduced monitoring frequency for bromate is the loss of the reduced monitoring frequency privilege and a responsibility to immediately return to a routine bromate monitoring schedule. The failure to collect, analyze and report all required bromate samples, during periods when the necessary bromide samples are not collected, analyzed and reported, is a bromate M&R violation.

Example #32 - M&R for Bromate Major Violation

Table 2-63 summarizes the System H treated water bromate and source water bromide monitoring results for 2004. On December 15, 2004, System H's operator collects the bromate sample at the entrance to the distribution system and the bromide sample in the source water according to the requirements of the monitoring plan.

Table 2-63. System H 2004 Treated Water Bromate and Source Water Bromide Monitoring Results (mg/L)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
Bromate	0.008	0.011	0.009	0.008	0.010	NS	0.015	0.006	0.005	0.005	NS	0.008	**0.008 (10)**
Bromide	0.040	0.035	0.048	0.041	0.037	NS	0.032	0.045	0.033	0.050	NS	0.041	**0.040 (10)**

RAA = Running Annual Arithmetic Average
NS = No Samples Taken

Example #32 Decision

During the 2004 calendar year, System H's operator has failed to collect all of the 12 samples necessary to fulfill the bromate monitoring requirements of the rule. After the 2nd quarter failure to collect a June sample and after the 4th quarter failure to collect a November sample, System H's monitoring record would result in Major M&R violations of the Stage 1 DBPR (for both quarters), since the operator failed to collect and analyze 100% of the required samples. System H is not eligible for a reduction in monitoring frequency because the system did not collect one full year of bromide samples. ***SDWIS Reporting Code 27/1011 flag Major.***

Public Notice Requirements

System H must provide Tier 3 public notice of the M&R violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System H must routinely report the information summarized in Tables 2-13, 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Bromate M&R violations are reported quarterly to SDWIS. The report of a violations begins on the 1st day of the quarter in which the system fails to collect, analyze or report one or more of the required samples. The violation end date is the last day of the quarter in which the system fails to collect, analyze or report one or more of the required samples. This PWS failed to take the required bromate samples in June, 2004, representing one quarter's monitoring and reporting violation. The violation has a begin date of April 1, 2004, and an end date of June 30, 2004. In addition, the PWS failed to take the required samples in November, 2004 resulting in another monitoring and reporting violation with a begin date of October 1, 2004 and an end date of December 31, 2004. Both violations should be reported to EPA.

Since EPA considers these violations to be major, SDWIS/FED will default the major violation flag to "Y". M&R violations are reported for water systems failing to monitor for (or report the results of monitoring for) the required number of samples. The appropriate SDWIS/FED bromate M&R violation data elements and individual DTF transactions for the 2nd quarter of 2004 are listed below in Exhibit 2.16. A similar M&R violation is necessary to report the failure to sample in November of 2004 for the 4th quarter.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1011
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be three months later than C1107*
C1131	Major Violation Flag	*"Y"*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0400001		I	C1103	1011		
D1	GA1234579	0400001		I	C1105	27		
D1	GA1234579	0400001		I	C1107	20040401		
D1	GA1234579	0400001		I	C1109	20040630		
D1	GA1234579	0400001		I	C1131	Y		

Exhibit 2.16 Bromate Major Monitoring and Reporting Violation Data Element Table and DTF Transactions

Example #33 - M&R for Bromate Major Violation Spanning Two Calendar Years

Table 2-64 summarizes the treated water bromate and source water bromide monitoring for calendar year 2005. During 2005, System H's operator collects the bromate sample at the entrance to the distribution system and the bromide sample in the source water according to the requirements of the monitoring plan.

Example #33 Decision

After the 4th quarter of 2005, the system's monitoring data shows that it is in compliance with the M&R requirements for bromate.

Additionally, as of November 2005, as the data in Tables 2-63 and 2-64 for the December 2004 to November 2005 RAA show, the operator has documented 12 months of source water bromide concentrations which demonstrate that the bromide concentrations are <0.05 mg/L. The operator is allowed to begin quarterly treated water bromate monitoring. However, he must continue the monthly source water bromide monitoring and those data must continue to show that the source water bromide concentration is <0.05 mg/L. For discussion purposes, in the event that the operator fails to collect and analyze the monthly source water bromide samples, he must immediately resume a monthly bromate monitoring schedule. Because the water system failed to take bromate samples in June 2004 and in November 2004 (see Table 2-63), the available samples should be used to determine compliance with the bromate MCL, until the full 12 months of data are available.

Table 2-64. System H 2005 Treated Water Bromate and Source Water Bromide Monitoring Results (mg/L)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Bromate	0.011	0.008	0.008	0.009	0.011	0.009	0.015	0.006	0.005	0.005	0.005	0.008
Bromate RAA Dec 2004 - Nov 2005: (0.008 + 0.011 + 0.008 + 0.008 + 0.009 + 0.011 + 0.009 + 0.015 + 0.006 + 0.005+ +0.005 + 0.005) = 0.1 / 12 = 0.008												
Bromate RAA 2005: (0.011 + 0.008 + 0.008 + 0.009 + 0.011 + 0.009 + 0.015 + 0.006 + 0.005 + 0.005 + 0.005 + 0.008) = 0.01 / 12 = 0.008												
Bromide	0.038	0.040	0.041	0.048	0.037	0.037	0.032	0.045	0.033	0.050	0.041	0.035
Bromide RAA Dec 2004 - Nov 2005: (0.041 + 0.038 + 0.040 + 0.041 + 0.048 + 0.037 + 0.037 + 0.032 + 0.045 + 0.033 + 0.050 + 0.041) = 0.0483 / 12 = 0.04												
Bromide RAA 2005: (0.038 + 0.040 + 0.041 + 0.048 + 0.037 + 0.037 + 0.032 + 0.045 + 0.033 + 0.050 + 0.041 + 0.035) = 0.477 / 12 = 0.04												

RAA = Running Annual Arithmetic Average of previous 12 monthly (average) values

Public Notice Requirement

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirement

Although System H is in compliance with the Stage 1 DBPR for bromide monitoring, the system must routinely report the information included in Tables 2-13, 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.4.4 Type 27/1006: Chloramines M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 & 9
Section IV-D, page 19
Appendix D, Attachments 1, 2, 3, 4 and 5
Cross-reference to Rule:
40 CFR141.132(c)(1)

Table 2-65. Chloramines Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	1006	**Major:** A failure to collect, analyze and report at least 90% of the required samples **Minor:** Collecting, analyzing and reporting at least 90%, but between 90% and 99% of the required samples

Example System Description - System J

System J is a small community water system that serves 1,250 people and uses only ground water. The system supplies water treated with chloramines for disinfection. System J operates only one treatment plant from which water enters the distribution system.

System J Summary

Population Served:	1,250
Source:	Groundwater
Treatment:	Chloramine

System J is a small (<10,000 people) ground water system for which the provisions of the Stage 1 DBPR are effective on January 1, 2004. The Stage 1 DBPR includes a requirement for all systems using chloramines to monitor for residual chloramine disinfectant (combined or total chlorine residual) at the same points in the distribution system and at the same time and place as total coliform monitoring. System J's certified operator collects and analyzes one sample for chloramines at each total coliform monitoring site, according to the requirements of the system's monitoring plan. Table 2-66 is a summary of System J's monitoring requirements. System J is required to take two (2) total coliform samples in the distribution system per month and therefore the operator takes two chloramines samples per month, recording the data on a disinfectant residual monitoring form.

Table 2-66. System J Monitoring Summary							
PARAMETER OR TASK	**SAMPLE LOCATION**			**SAMPLE FREQUENCY**			
	Plant	**Entrance to Distribution System**	**Distribution System**	**Daily**	**Monthly**	**Quarterly**	**Annually or less than annually**
Disinfectants:							
Chlorine / Chloramines			**X**		**X**		
DBPs:							
TTHM /HAA5			**X**				**X[1]**

Monitoring Plan REQUIRED	**YES**	**NO**	**SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE**	**YES**	**NO**
	X				**X** (< 3,300 served and not a Subpart H system)

[1] Sample must be collected during the warmest month of the year.

Example #34 - M&R for Chloramines Compliance Over 12 Months

Table 2-67 summarizes the chloramine monitoring results for 2004. On December 15, 2004, System J's operator collects and analyzes the two chloramine samples in the distribution system.

Table 2-67. System J 2004 Chloramine Monitoring Results - mg/L as Cl_2

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
Site #1	1.1	1.3	1.1	1.5	1.1	1.4	1.0	1.2	1.2	1.2	1.3	1.1	NA
Site #2	0.9	0.9	1.0	1.3	1.1	1.2	1.0	1.0	1.1	0.9	1.1	1.0	NA
System Monthly Average	1.0	1.1	1.1	1.4	1.1	1.3	1.0	1.1	1.2	1.1	1.2	1.1	1.1

RAA = Running Annual Arithmetic Average of previous 12 monthly average values

Example #34 Decision

System J's operator has completed the 1st year of chloramine monitoring and the data show that the system is in compliance with the M&R requirements for chloramines since 100% of the required samples were taken. Additionally, at the end of the 1st year of monitoring (4 quarters of monitoring) System J is in compliance with the MRDL because the arithmetic average of the twelve (12) monthly average chloramine values does not exceed the MRDL of 4.0 mg/L established by the Stage 1 DBPR for

chloramines. During the 1st full year of monitoring, the operator was able to determine that System J was in compliance with the MRDL after each quarter by summing the available monthly arithmetic average chloramine concentrations, assuming zero values for any months for which monitoring had not yet occurred, and dividing the result by twelve. After any quarter when the result exceeds 4.0 mg/L, a violation of the MRDL is defined.

Public Notice Requirement

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System J is in compliance with Stage 1 DBPR for chloramines, the system must routinely report the information included in Table 2-35 to the Primacy Agency. Please refer to 40 CFR 141.134 for TTHM /HAA5 reporting requirements.

Primacy Agency To SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #35 - M&R for Chloramines Major Violation

Table 2-68 summarizes the chloramine monitoring for the 1st and 2nd quarters of 2005. On January 16, 2005, the operator is called to active military duty for 90 days. When he returns to work on April 16, 2005, he finds that, during his absence, chloramine samples were collected and analyzed only at site #1. He also finds that no report regarding the 1st quarter of 2005 was filed with the Primacy Agency by April 10. System J's operator immediately collects and analyzes the correct samples for the month of April, and submits a report of the available data for the 1st quarter of 2005 to the Primacy Agency on April 20, 2005.

Table 2-68. System J 2005 Chloramine Monitoring Results - mg/L as Cl_2

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
Site #1	1.1	4.7	3.3	3.0	1.9	1.4							
Site #2	NS	NS	NS	1.3	1.8	1.1							
System Monthly Average	1.1	4.7	3.3	2.2	1.9	1.3							
RAA			1.6			1.7							

RAA = Running Annual Arithmetic Average of previous 12 monthly average values
NS = No sample collected / analyzed

Example #35 Decision

During the 1st quarter of 2005, three of six (50%) of the required samples for chloramines were collected and analyzed. This results in a major chloramines M&R violation for System J for the 1st quarter of 2005 since there was a failure to collect and report at least 90% of the required chloramine samples. During the 2nd quarter of 2005, the operator collected 100% of the required samples, and met the M&R requirements for chloramine monitoring. Additionally, the data shows that System J remains in compliance with the MRDL established for chloramines, because the running annual arithmetic averages calculated at the end of the 1st quarter of 2005 do not exceed 4.0 mg/L. The RAAs are calculated using the available data points and will produce a record of compliance or noncompliance with the MRDL. However, the missing data from all RAA periods that would utilize the 1st quarter of 2005 as part of the four quarter set will produce a M&R violation that spans the period from three quarters prior to the quarter of missing data, to three quarters past the quarter of missing data.

Public Notice Requirements

System J must provide Tier 3 public notice of the chloramines M&R violation after the 1st quarter according to the requirements of 40 CFR141.201, and continue to do so until the 1st quarter of 2006, when System J has the potential to have four consecutive quarters of data.

System Reporting Requirements

System J must routinely report the information summarized in Table 2-35 to the Primacy Agency. Please refer to 40 CFR 141.134 for TTHM / HAA5 reporting requirements.

Primacy Agency to SDWIS/FED Reporting

System J must report a major M&R violation for the 1st quarter of 2005. ***SDWIS Reporting Code 27/1006 flag Major.***

The appropriate SDWIS/FED chlorine M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.17.

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1006
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*Must be three months later than C1107*
C1131	Major Violation Flag	Y *or* N *(Major is defined as reporting < 90% of required samples, Minor as any other failure to report, such as failure to measure chlorine in a total coliform sample)*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0500001		I	C1103	1006		
D1	GA1234579	0500001		I	C1105	27		
D1	GA1234579	0500001		I	C1107	20050101		
D1	GA1234579	0500001		I	C1109	20050331		
D1	GA1234579	0500001		I	C1131	Y		

Exhibit 2.17 Chloramines Minor Monitoring Violation Data Element Table and DTF Transactions

2.4.5 Type 27/1009: Chlorite M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:

Section II, pages 4 & 11
Section IV-D, page 27
Appendix D, Attachment 6

Cross-reference to Rule:

40 CFR141.132(b)(2)

Table 2-69. Chlorite Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	1009	**Major:** A failure to collect, analyze and report at least 90% of the daily samples at the entrance to the distribution system or any required 3-sample set in the distribution system. **Minor:** Collecting, analyzing and reporting at least 90%, but between 90% and 99% of the required samples

Example System Description - System GG

System GG is a large Subpart H community water system serving 265,000 people that uses surface water. The water is treated with a single conventional filtration surface water treatment plant that uses chlorine dioxide for oxidation and chlorine as a final disinfectant. System GG has one treatment plant and one entry point to the distribution system.

System GG Summary

Population Served:	256,000
Source:	Surface water
Treatment:	Conventional filtration, chlorine dioxide, chlorine

System GG is a large (>10,000 people) Subpart H system for which the provisions of the Stage 1 DBPR are effective on January 1, 2002. The Stage 1 DBPR includes a requirement for all systems using chlorine dioxide, for either disinfection or oxidation, to monitor for chlorite on a daily basis at the entrance to the distribution system. System GG's certified operator collects one sample for chlorite, each day, at the entrance to the distribution system, according to the requirements of the system's monitoring plan. Chlorite samples are analyzed by a certified laboratory. Table 2-70 presents a summary of System GG's monitoring requirements.

System GG's certified operator records the chlorite analysis result each day on a chlorite monitoring form. In addition to the routine daily monitoring, the operator must also collect and analyze a 3-sample set of samples for chlorite once per month in the distribution system at locations described in System GG's monitoring plan. In the event that any daily sample collected at the entrance to the distribution system is greater than 1.0 mg/L, the operator must collect a 3-sample set from the distribution system on the following day. These additional compliance assessment samples for chlorite must be collected at sites that are described in System GG's monitoring plan and that meet the requirements of 40 CFR141.132(b)(2)(ii). A system that completes additional compliance assessment sampling in the distribution system on the day after a daily sample that exceeds the MCL may substitute that 3-sample set monitoring for the required single monthly 3-sample set.

Example #36 - M&R for Chlorite

Table 2-70 summarizes the chlorite monitoring results for January, 2002. On January 31, 2002, System GG's operator collects and analyzes the daily routine entrance to the distribution system sample for chlorite. He records the results on the chlorite monitoring form.

Table 2-70. System GG Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
Chlorine Dioxide		X		X			
			X	A distribution system 3- sample set must be collected the day following any exceedance of 0.8 mg/L at the entrance to the distribution system			
DBPs:							
TTHM /HAA5			X			X	
Chlorite (grab)		X		X			
(3-sample set)			X		X		
(3-sample set)			X	Distribution system 3-sample set must be collected on the day following any daily sample that exceeds 1.0 mg/L at the entrance to the distribution system			
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

Table 2-71. System GG January 2002 Chlorite Monitoring Results (mg/L)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		day 1 0.5 mg/L	day 2 0.6 mg/L	day 3 **NS**	day 4 0.9 mg/L	day 5 1.0 mg/L
day 6 0.7 mg/L	day 7 **NS**	day 8 **NS**	day 9 1.1 mg/L	day 10 0.9 mg/L 0.9 mg/L 0.8 mg/L 0.7 mg/L	day 11 0.8 mg/L	day 12 1.1 mg/L
day 13 **NS** 0.9 mg/L 0.8 mg/L 0.8 mg/L	day 14 1.0 mg/L	day 15 0.6 mg/L	day 16 0.6 mg/L	day 17 0.7 mg/L	day 18 0.9 mg/L	day 19 0.9 mg/L
day 20 1.4 mg/L	day 21 0.8 mg/L 0.8 mg/L 0.7 mg/L 0.7 mg/L	day 22 0.7 mg/L	day 23 0.6 mg/L	day 24 0.7 mg/L	day 25 0.7 mg/L	day 26 0.8 mg/L
day 27 0.8 mg/L	day 28 **NS**	day 29 **NS**	day 30 1.0 mg/L	day 31 0.9 mg/L		

Note: data in box to left is routine daily entrance to the distribution system, data to right is 3-sample distribution system set
NS = no sample collected / analyzed

Example #36 Decision

A review of System GG's chlorite monitoring data for January 2002 discloses a chlorite M&R violation. System GG fed chlorine dioxide continuously throughout the month, so the operator was required to take a minimum of 31 routine daily samples and at least one routine monthly 3-sample set. Two additional 3-sample sets were required due to entry point results, bringing the total number of required samples to 40 (31 daily and 9 additional samples). He actually took 25 of the monthly routine samples and three 3-sample sets of distribution system samples. He collected and analyzed 34 of 40 required samples, or 85 %. That documents a major M&R violation for chlorite (failure to collect and report at least 90% of required chlorite samples). For discussion purposes, although the operator failed to take several samples during the month, a review of the data show that there was no chlorite MCL violation during the month. The arithmetic averages of each 3-sample sets taken on day10 (arithmetic average = 0.8 mg/L), day 13 (arithmetic average = 0.8 mg/L) and day 21 (arithmetic average = 0.7 mg/L) are included in the calculation to determine compliance with the MCL. Since no result exceeds the 1.0 mg/L MCL for chlorite, there is no violation of the MCL in January 2002.

If a PWS fails to take a three sample set, either for the once-a-month sample, or as a result of an entry point exceedance, each of the samples required (a three sample set counts as 3 samples) will be used, as well as each of the samples missed, for computing whether the violation is a major or minor.

Public Notice Requirements

System GG must provide Tier 3 public notice of this chlorite M&R violation according to the requirements of 40 CFR141.201.

System Reporting Requirements

System GG must routinely report the information summarized in Tables 2-6, 2-35, 2-45, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED chlorite M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.18. ***SDWIS Reporting Code 27/1009 flag Major.***

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1009
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	
C1131	Major Violation Flag	Y *or* N *(Major is defined as reporting < 90% of required samples, Minor as any other failure to report)*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0200001		I	C1103	1009		
D1	GA1234579	0200001		I	C1105	27		
D1	GA1234579	0200001		I	C1107	20020101		
D1	GA1234579	0200001		I	C1109	20020131		
D1	GA1234579	0200001		I	C1131	Y		

Exhibit 2.18 Chlorite M&R Violation Data Element Table and Individual DTF Transactions

2.4.6 Type 27/1008: Chlorine Dioxide M&R Violation

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 & 10
Section IV-D, page 20
Appendix D, Attachment 6
Cross-reference to Rule:
40 CFR141.132(c)(2)

Table 2-72. Chlorine Dioxide Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	1008	A failure to collect and report 100% of the required samples

Example System Description - System HH

System HH is a small community water system serving 900 people that uses ground water. The system supplies water treated with chlorine dioxide for oxidation of iron and manganese on a routine basis. System HH utilizes one treatment plant and it uses chlorine to maintain a disinfectant residual in the distribution system. There are no disinfection addition points after the entrance to the distribution system.

System HH Summary

Population Served:	900
Source:	Ground water
Treatment:	Chlorine dioxide, oxidation for iron/manganese removal

System HH is a small (<10,000 people) community water system for which the provisions of the Stage 1 DBPR regarding the use of chlorine dioxide are effective on January 1, 2004. The Stage 1 DBPR includes a requirement for all systems using chlorine dioxide, for either disinfection or oxidation, to monitor for chlorine dioxide according to the requirements of 40 CFR141.132(c)(2) on a daily basis at the entrance to the distribution system. System HH's certified operator collects and analyzes one sample for chlorine dioxide each day, at the entrance to the distribution system, according to the requirements of the system's monitoring plan. Table 2-73 presents a summary of System HH's Stage 1 monitoring requirements.

The operator records the chlorine dioxide analysis result (as mg/L ClO_2) each day on a chlorine dioxide monitoring form. In addition to the daily monitoring, the system must collect and analyze three chlorine dioxide samples, referred to as the 3-sample set, in the distribution system the day following a daily sample that exceeds 0.8 mg/L. The three samples collected in the distribution system must be from locations and at times described in the monitoring plan and that meet the requirements of 40 CFR141.132(c)(2)(ii). In this example, the three samples must be collected as close to the 1st customer as possible, at intervals of at least six hours. There is no opportunity for a reduced monitoring frequency for chlorine dioxide.

Table 2-73. System HH Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
Chlorine Dioxide		X		X			
			X	A distribution system 3- sample set must be collected the day following any exceedance of 0.8 mg/L at the entrance to the distribution system			
DBPs:							
TTHM /HAA5			X				X
Chlorite (grab)		X		X			
(3-sample set)			X		X		
(3-sample set)			X	A distribution system 3-sample set must be collected on the day following any daily sample that exceeds 1.0 mg/L at the entrance to the distribution system			

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X				X (< 3,300 served and not a Subpart H system)

Example #37 - M&R for Chlorine Dioxide

Table 2-74 summarizes System HH's chlorine dioxide monitoring results for March, 2004. On March 31, 2004, System HH's certified operator collects and analyzes the required daily entrance to the distribution system sample for chlorine dioxide. He records the results on the chlorine dioxide monitoring form.

Table 2-74. March 2004 Chlorine Dioxide Monitoring Results mg/L as ClO_2

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Day 1 0.7 mg/L	Day 2 **NS**	**Day 3** 1.0 mg/L	**Day 4** 0.9 mg/L 0.9 mg/L 0.8 mg/L 0.5 mg/L	**Day 5** 0.9 mg/L 0.8 mg/L 0.7 mg/L 0.5 mg/L	Day 6 0.7 mg/L 0.7 mg/L 0.7 mg/L 0.5 mg/L
Day 7 0.7 mg/L	Day 8 0.6 mg/L	Day 9 **NS**	Day 10 **NS**	Day 11 0.8 mg/L	Day 12 0.7 mg/L	Day 13 0.5 mg/L
Day 14 0.7 mg/L	Day 15 0.6 mg/L	Day 16 **NS**	Day 17 **NS**	Day 18 0.7 mg/L	Day 19 0.7 mg/L	Day 20 0.3 mg/L
Day 21 0.4 mg/L	Day 22 0.7 mg/L	Day 23 **NS**	Day 24 **NS**	Day 25 0.8 mg/L	Day 26 0.7 mg/L	Day 27 0.6 mg/L
Day 28 0.8 mg/L	**Day 29** 0.9 mg/L	Day 30 0.8 mg/L 0.8 mg/L 0.7 mg/L 0.6 mg/L	Day 31 0.7 mg/L			

Note: the values to the left of each day square are daily routine monitoring (entrance to the distribution system) results and the values to the right of the day square are additional monitoring in the distribution system, required the day following a day when any daily routine sample exceeds the 0.8 mg/L MRDL for chlorine dioxide.
NS = no sample collected / analyzed

Example #37 Decision

A review of System HH's chlorine dioxide monitoring data for March 2004, shows that, although the operator was required to collect and report 31 routine daily samples for chlorine dioxide at the entrance to the distribution system and 12 distribution system samples, for a total of 43 samples, he failed to take seven (7) daily samples. This failure to take 100% of the required chlorine dioxide samples is an M&R violation, that must be reported to the Primacy Agency within 10 days of the end of the quarter (April 10, 2004), along with the M&R violation summary for January 2004 and February 2004.

Additional review of the data shows that the operator must report that the MRDL was exceeded twice during March 2004. System HH must report an acute violation of the MRDL for chlorine dioxide for March 4th, because the MRDL of 0.8 mg/L is exceeded by the combination of the March 3, 2004 routine daily sample (1.0 mg/L) and also by one or more of the March 4, 2004 additional distribution system samples (0.9 mg/L). System HH's operator must report a 2nd MRDL violation, however, it is identified as a non-acute violation for March 5th , because none of the additional distribution system samples taken on March 5, 2004 exceed the MRDL, even though the routine entrance to the distribution system samples on both days exceed the MRDL value of 0.8 mg/L. Later in the month, on March 29, 2004, the routine daily entrance to the distribution system sample exceeds the MRDL (0.9 mg/L), however, neither the March 30, 2004 routine sample nor the three additional distribution system samples for March 30, 2004 exceed the chlorine dioxide MRDL of 0.8 mg/L. For chlorine dioxide, any failure to take samples in the distribution system the day following an exceedance of the MRDL by an entrance to the distribution system sample is also considered an MRDL violation. Please see Section 2.2.3 for a discussion of the chlorine dioxide MRDL reporting requirements.

Public Notice Requirements

System HH must provide Tier 3 public notice regarding the M&R violations according to the requirements of 40 CFR141.201.

System Reporting Requirements

System HH must routinely report the information summarized in Tables 2-6, 2-35, and 2-45 to the Primacy Agency. Please refer to 40 CFR 141.134 for TTHM / HAA5 reporting requirements.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED chlorine dioxide M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.19. ***SDWIS Reporting Code 27/1008 (M&R Violation).***

Data Elements:

Number	Name	Value or *Comment*
C0101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	1009
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	
C1112	Severity Indicator Count	*Number of days not sampled or reported*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0400001		I	C1103	1008		
D1	GA1234579	0400001		I	C1105	27		
D1	GA1234579	0400001		I	C1107	20040301		
D1	GA1234579	0400001		I	C1109	20040331		
D1	GA1234579	0400001		I	C1112	7		

Exhibit 2.19 Chlorine Dioxide M&R Violation Data Element Table and Individual DTF Transactions

2.4.7 Type 27/2456: HAA5 M&R Violation and Type 27/2950: TTHM M&R Violation

2.4.7.1 Subpart H at Least 10,000 People

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 12
Section IV-D, page 21
Appendix D, Attachment 1
Cross-reference to Rule:
40 CFR141.132(b)

Table 2-75. HAA5 Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	2456	**Major**-Failure to collect & report at least 90% of the required samples **Minor**-Collect & report at least 90% and between 90% and 99% of the required samples (but not all required)

Table 2-76. TTHM Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	2950	**Major**-Failure to collect & report at least 90% of the required samples **Minor**-Collect & report at least 90% and between 90% and 99% of the required samples (but not all required)

Example System Description - System JJ

System JJ is a large Subpart H system serving 10,050 people which uses surface water and ground water determined to be under the direct influence of surface water. All water from the surface water and GWUDI sources is treated at the same conventional filtration plant. Chlorine is used as a disinfectant.

System JJ Summary

Population Served:	10,050
Source #1:	Groundwater under the direct influence
Source #2:	Surface water
Treatment #1:	(serves both sources) conventional filtration, chlorine

The provisions of the Stage 1 DBPR regarding the use of chemical disinfectants are effective for System JJ on January 1, 2002. The Stage 1 DBPR includes a requirement for all systems using chemical disinfectants, for either disinfection or oxidation, to monitor for the disinfection byproducts HAA5 and TTHM. Monitoring is performed according to the requirements of 40 CFR141.132(b) in the distribution system at a frequency of four times per plant per quarter. System JJ's certified operator collects four samples for HAA5 and for TTHM, as described in the system's monitoring plan, and in conformance with the sample location descriptions included in 40 CFR141.132(b)(1)(i). Samples are analyzed by a certified laboratory. Table 2-77 presents a summary of System JJ's Stage 1 monitoring requirements.

Table 2-77. System JJ Monitoring Summary

PARAMETER OR TASK	SAMPLE LOCATION			SAMPLE FREQUENCY			
	Plant	Entrance to Distribution System	Distribution System	Daily	Monthly	Quarterly	Annually or less than annually
Disinfectants:							
Chlorine / Chloramines			X		X		
DBPs:							
TTHM /HAA5			X			X	
DBP Precursors:							
Paired TOC	X				X		
Alkalinity (as $CaCO_3$)	X				X		
SUVA*	X				X		

Monitoring Plan REQUIRED	YES	NO	SUBMIT MONITORING PLAN TO PRIMACY AGENCY BY SPECIFIC DATE	YES	NO
	X			X	

* Optional - Alternative compliance criteria requirement of 40 CFR141.135

The operator records the HAA5 and TTHM results on a monitoring form. A reduced monitoring schedule (one sample per treatment plant per quarter at the distribution system location reflecting maximum residence time) is allowed after at least one year of routine monitoring for either parameter. When the source water annual average TOC level, before any treatment, is less than or equal to 4.0 mg/L, and, when the annual average HAA5 or TTHM concentration is less than or equal to 0.030 mg/L for HAA5 and 0.040 mg/L for TTHM (50% of the established MCL) a system may go to reduced monitoring.

Systems that qualify for reduced monitoring may remain on reduced monitoring as long as the average of all samples taken in a year (or the result of the one sample taken in a year, for those on annual monitoring) does not exceed 0.045 mg/L for HAA5 and 0.060 mg/L for TTHM. This determination is made on a quarterly basis. The system must return to routine monitoring the quarter immediately following a quarter when the system exceeds 0.045 mg/L for HAA5, or 0.060 mg/L for TTHM. The Primacy Agency may return a system to a routine monitoring schedule at their discretion (40 CFR141.132(b)(1)(iv)).

Example #38 - M&R TTHM and HAA5 Calendar Year 2002

Table 2-78 summarizes System JJ's HAA5 and TTHM monitoring results for 2002. On December 31, 2002, System JJ's operator reviews the HAA5 & TTHM data collected for 2002.

Example #38 Decision

System JJ has collected and analyzed all of the necessary samples for HAA5 and TTHM during the 1st full year after the applicable date of the rule. The data for system JJ shows that there are no M&R violations for these parameters (HAA5 & TTHM), and there are no MCL violations during this period. The source water TOC monitoring shows that the annual arithmetic average TOC concentration is 3.7 mg/L, which is $\leq$4.0 mg/L, fulfilling one condition for reduced monitoring. However the system may not reduce monitoring because the RAA HAA5 concentration exceeds 0.030 mg/L and the RAA TTHM concentration exceeds 0.040 mg/L, figures which represent 50% of the MCL values.

Public Notice Requirement

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirement

Although System JJ is in compliance with the Stage 1 DBPR for HAA5 and TTHM monitoring, the system must routinely report the information included in Tables 2-22, 2-35, 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #39 - M&R for HAA5 & TTHM 2002 / 2003

Table 2-79 summarizes System JJ's monitoring results for 2003. On June 30, 2003, System JJ's operator reviews the system's monitoring data for the past year, including the 3rd quarter of 2002, the 4th quarter of 2002 (found in Table 2-78), the 1st quarter of 2003 and the 2nd quarter of 2003 (found in Table 2-79). As displayed in the Tables, he has calculated the RAA for HAA5, TTHM and source water TOC.

Table 2-78. System JJ 2002 TTHM & HAA5 Monitoring Results (mg/L)

Parameter	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
HAA5 MCL = 0.060 mg/L			0.079 0.049 0.062 0.086			0.077 0.044 0.055 0.052			0.060 0.051 0.049 0.043			0.040 0.039 0.033 0.035	
HAA5 QAvg			0.069			0.057			0.051			0.037	0.054
TTHM MCL = 0.080 mg/L			0.069 0.0660. 063 0.055			0.065 0.063 0.059 0.049			0.061 0.055 0.053 0.051			0.060 0.054 0.051 0.047	
TTHM QAvg			0.063			0.059			0.055			0.053	0.058
TOC Source water	4.0	5.9	5.0	5.3	4.6	3.9	3.3	3.1	3.0	2.2	2.4	2.1	3.7
TOC QAvg			5.0			4.6			3.1			2.2	3.7

QAvg = Quarterly arithmetic average value
RAA = Running annual arithmetic average value

Table 2-79. System JJ 2003 TTHM & HAA5 Monitoring Results (mg/L)

Parameter	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
HAA5 MCL = 0.060 mg/L			0.049 0.029 0.022 0.026			0.037 0.034 0.025 0.022			0.020 0.031 0.029 0.023			0.020 0.019 0.023 0.025	
HAA5 Q Avg			0.031			0.030			0.026			0.022	0.027
HAA5 RAA			0.044			0.037			0.031				
TTHM MCL = 0.080 mg/L			0.039 0.036 0.033 0.025			0.065 0.053 0.049 0.049			0.031 0.025 0.023 0.021			0.030 0.024 0.021 0.017	
TTHM Q Avg			0.033			0.054			0.025			0.023	0.034
TTHM RAA			0.050			0.049			0.041				
TOC Source water	4.0	5.9	5.0	5.3	4.6	3.9	3.3	2.9	3.0	2.2	2.4	2.1	3.7
Q Avg			4.9			4.6			3.1			2.2	3.7
TOC RAA			3.7			3.7			3.7				

QAvg = Quarterly arithmetic average value
RAA = Running annual arithmetic average value

Example #39 Decision

Again, System JJ's operator concludes that the system has no M&R violations to report for the period July 1, 2002 to June 30, 2003. Additionally, the system is in compliance with the MCLs for HAA5 (0.060 mg/L) and TTHM (0.080 mg/L) calculated as an RAA of quarterly average values for the 12 month periods ending March 31, 2003 and June 30, 2003.

System JJ is not eligible for reduced monitoring after June 30, 2003, because the system data shows that it does not meet all conditions specified in 40 CFR141.132(b)(1)(ii). The RAA source water TOC is less than 4.0 mg/L, however, neither the HAA5 nor the TTHM RAA concentrations are below the levels specified in the rule as a prerequisite for reduced monitoring.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System JJ is in compliance with the Stage 1 DBPR for TTHM and HAA5, the system must routinely report the information included in Tables 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

Example #40 - M&R for HAA5 & TTHM Calendar Year 2003

On September 30, 2003 and on December 31, 2003, System JJ's operator reviews the data for the system. On September 30, 2003, he reviews the data for the 4th quarter of 2002, the 1st quarter of 2003, the 2nd quarter of 2003 and the 3rd quarter of 2003. On December 31, 2003, he reviews the data for the calendar year (four quarters) of 2003.

Example #40 Decision

There are no M&R violations and no MCL violations at this time. Since there are no TTHM or HAA5 violations, the water system is in compliance with the rule requirements as they apply to TTHM and HAA5 for these monitoring periods. The operator concludes that the system qualifies for a reduction in monitoring for HAA5 and TTHM, after December 31, 2003, because its RAA source water TOC (3.7 mg/L) is <4.0 mg/L, the RAA HAA5 concentration (0.027 mg/L) is less than 0.030 mg/L, and the RAA TTHM concentration (0.034 mg/L) is less than 0.040 mg/L. The operator is allowed to begin, in the 1st quarter of 2004, to take the HAA5 and TTHM samples on a frequency of once (per treatment plant) per quarter at the distribution system location reflecting maximum residence time. He can continue to sample at this reduced frequency, as long as the RAA source water TOC concentration is $\leq$ 4.0 mg/L, the HAA5 RAA concentration does not exceed 0.045 mg/L and the TTHM RAA concentration does not exceed 0.60 mg/L. In the 1st quarter following a quarter when these values are exceeded, the system must return from a reduced monitoring to a routine monitoring schedule.

Public Notice Requirements

Because the system is in compliance, no public notice is required for this parameter for this reporting period.

System Reporting Requirements

Although System JJ is in compliance with the Stage 1 DBPR for TTHM and HAA5, the system must routinely report the information included in Tables 2-22, 2-35, and 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

Because the system is in compliance, no SDWIS/FED reporting is required for this parameter for this reporting period.

2.4.7.2 Subpart H 500 to 9,999 People

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 12
Section IV-D, page 21
Appendix D, Attachment 2
Cross-reference to Rule:
40 CFR141.132(b)
Please see Tables 2-75 and 2-76

Example System Description - System KK

System KK is a small Subpart H system serving 8,900 people (at least 500 people but no more than 9,999 people) to which the requirements of Stage 1 DBPR are applicable on or before January, 2004. The system uses surface water treated in one conventional filtration plant. The system uses chlorine as a chemical disinfectant applied at one location and must monitor for the disinfection byproducts HAA5 and TTHM according to the requirements of 40 CFR141.132(b) in the distribution system at a frequency of once per quarter at the location of maximum residence time.

System KK Summary

Population Served:	8,900
Source:	surface water
Treatment:	conventional filtration, chlorine

Example #41 - M&R for HAA5 and TTHM Small System Quarterly

Table 2-80 presents a summary of System KK's HAA5 and TTHM monitoring results for year 2004.

Table 2-80. System KK 2004 HAA5 and TTHM Monitoring Results (mg/L)

Parameter	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
HAA5 MCL = 0.060 mg/L			0.038			NO SAMPLE			0.042			0.055	0.045
TTHM MCL = 0.080 mg/L			0.070			NO SAMPLE			0.068			0.070	0.069

On July 1, 2004, system KK's operator reviews the data for the 1st and 2nd quarters of 2004. System KK did not complete the necessary monitoring of HAA5 and TTHM for the 2nd quarter of 2004.

Example #41 Decision

System KK's sampling record shows a Major M&R violation in the 2nd quarter of 2004, resulting from a failure to take the necessary single sample in that quarter. A Major M&R violation occurs when a system fails to take at least 90% of the required samples. In this case, when only one sample per quarter is required, the failure to take it is a Major M&R violation for the quarter. A Major M&R violation for the 2nd quarter of 2004 should be reported to SDWIS for both HAA5 and TTHM.

Public Notification Requirement

System KK must provide Tier 3 public notice of this HAA5 and TTHM monitoring and reporting violation after the 2nd quarter of 2004, according to the requirements of 40 CFR141.201.

System Reporting Requirement

System KK must routinely report the information summarized in Tables 2-22 and 2-35 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

The appropriate SDWIS/FED TTHM and HAA5 M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.20. Note that two violations are to be reported; one for HAA5 and the other for TTHM. ***SDWIS Reporting Code 27/2456 (for HAA5) and 27/2950 (for TTHM).***

Data Elements:

Number	Name	Value or *Comment*
C101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	2456 *(for HAA5)* or 2950 *(for TTHM)*
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*3 months later than C1107*
C1131	Major Violation Flag	Y *or* N *(Major is defined as reporting <90% of required samples, Minor as any other failure to report)*

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0400001		I	C1103	2456		
D1	GA1234579	0400001		I	C1105	27		
D1	GA1234579	0400001		I	C1107	20040401		
D1	GA1234579	0400001		I	C1109	20040630		
D1	GA1234579	0400001		I	C1131	Y		

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0400001		I	C1103	2950		
D1	GA1234579	0400001		I	C1105	27		
D1	GA1234579	0400001		I	C1107	20040401		
D1	GA1234579	0400001		I	C1109	20040630		
D1	GA1234579	0400001		I	C1131	Y		

Exhibit 2.20 TTHM and HAA5 M&R Violations Data Element Table and Individual DTF Transactions

2.4.7.3 Subpart H <500 People

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 12
Section IV-D, page 21
Appendix D, Attachment 3
Cross-reference to Rule:
40 CFR141.132(b)
Please see Tables 2-75 and 2-76

If a Subpart H system serving less than 500 people that is required to collect and report one HAA5 and TTHM sample per plant per year fails to collect that sample, the failure results in an M&R violation for the calendar year in which no sample was collected. The appropriate data elements and DTF transactions would be as shown in Exhibit 2-20, except the Compliance Period Begin Date, data element C1107, should be entered as January 1 of the appropriate year, and the Compliance Period End Date, data element C1109 should be entered as December 31 of that same year. The M&R violation is a Major violation signified by a "Y" for data element C1131.

2.4.7.4 GW at least 10,000 People

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 & 13
Section IV-D, page 21
Appendix D, Attachment 4
Cross-reference to Rule:
40 CFR141.132(b)
Please see Tables 2-75 and 2-76

If a groundwater system determined not to be under the direct influence of surface water that serves at least 10,000 people fails to collect and report the necessary one sample per plant per quarter for HAA5 and TTHM, the failure results in an M&R violation for the quarter in which the sample was not taken. The appropriate data elements and DTF transactions would be as shown in Exhibit 2-20, except the Begin and End Dates of Compliance Period should be the begin and end dates of the quarter in which the violation took place. The M&R violation is a Major violation if the sample missed results in less than 90% of the samples required being collected in that quarter. A Major M&R violation is signified by a "Y" for data element C1131.

2.4.7.5 GW < 10,000 People

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 and 13
Section IV-D, page 21
Appendix D, Attachment 5
Cross-reference to Rule:
40 CFR141.132(b)
Please see Tables 2-75 and 2-76

If a groundwater system, determined not to be under the direct influence of surface water, that serves less than 10,000 people fails to collect and report the necessary one sample per plant per year for HAA5 and TTHM, the failure results in an M&R violation for the calendar year in which no sample was collected.

The appropriate data elements and DTF transactions would be as shown in Exhibit 2-20, except the Compliance Period Begin and End Dates should be the beginning and end of the calendar year in which the violation took place. The M&R violation is a Major violation signified by a "Y" for data element C1131.

2.4.8 Type 27/2920: Source and Finished Water TOC / Source Water Monitoring Alkalinity

Cross-reference to Stage 1 DBPR Implementation Guidance:
Section II, pages 4 & 11
Section IV-D, page 28
Appendix D, Attachment 8, page 53
Cross-reference to Rule:
40 CFR141.132(d)

Table 2-81. Paired TOC and Alkalinity Monitoring and Reporting Violation

Violation Code	Contaminant Code	Violation Description
27	2920	A failure to collect source and finished water TOC samples and alkalinity sample

Example System Description - System QQ

System QQ is a Subpart H system serving 18,000 people that uses a GWUDI source and a single conventional treatment plant. Chlorine is used for primary and secondary disinfection. The Stage 1 DBPR includes a requirement to collect and analyze a source water sample for TOC and alkalinity and a finished water TOC sample once per month (at each treatment plant). The requirements of the Stage 1 DBPR are effective for system QQ, since it serves 10,000 or more people, on January 1, 2002.

System QQ Summary

Population Served:	18,000
Source:	Groundwater under the direct influence
Treatment:	Conventional filtration, chlorine disinfection

Example #42 - M&R Paired TOC/Finished Alkalinity

Table 2-82 summarizes System QQ's monitoring results for the 1st quarter of 2002. On April 1, 2002, System QQ's operator reviewed the Paired TOC and Alkalinity data he has collected in 2002.

Table 2-82. System QQ 2002 TOC and Alkalinity (mg/L)

Parameter	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	RAA
TOC Source	5.9	No Sample	4.8										
TOC Finished	2.0	No Sample	2.0										
Alkalinity Source	105	No Sample	100										
TOC % Removal	35%	--	35%										
TOC TT % Removal	65%	--	65%										

Example #42 Decision

System QQ failed to collect the required routine monthly TOC/Alkalinity samples in February 2002. This results in a monitoring and reporting violation for the 1st quarter of 2002.

Public Notice Requirement

System QQ must provide Tier 3 public notice of this M&R violation according to the requirements of 40 CFR141.201.

System Reporting Requirement

System QQ must routinely report the information summarized in Table 2-53 to the Primacy Agency.

Primacy Agency to SDWIS/FED Reporting

All failures to collect source and finished water TOC and source water alkalinity, regardless of how many failures occur in a quarter are reported to SDWIS using the data elements and DTF transactions shown in Exhibit 2-21. The Compliance Period Begin Date and Compliance Period End Date should be the beginning and end dates of the quarter in which the violation was defined.

The appropriate SDWIS/FED TOC and Alkalinity M&R violation data elements and individual DTF transactions are listed below in Exhibit 2.21.

Data Elements:

Number	Name	Value or *Comment*
C101	PWS-ID	*Qualifier 1*
C1101	Violation ID	*Qualifier 2*
C1103	Contaminant Code	2920
C1105	Violation Type Code	27
C1107	Compliance Period Begin Date	
C1109	Compliance Period End Date	*3 months later than C1107*
C1131	Major Violation Flag	Y

DTF Transactions:

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
D1	GA1234579	0200001		I	C1103	2920		
D1	GA1234579	0200001		I	C1105	27		
D1	GA1234579	0200001		I	C1107	20020101		
D1	GA1234579	0200001		I	C1109	20020331		
D1	GA1234579	0200001		I	C1131	Y		

Exhibit 2.21 TOC/Alkalinity M&R Violations Data Element Table and Individual DTF Transactions

Section 3

General SDWIS Reporting

This page intentionally left blank

General SDWIS Reporting

3.1 Federally Reported Violations

Under SDWIS/FED reporting, Primacy Agencies only report when violations occur. In the interest of reducing the reporting burden on Primacy Agencies, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the Primacy Agency. Any violation of the rule, whether included in Table 2.1a or not, is a basis for a Primacy Agency or federal enforcement action.

Table II-2, from the *Stage 1 DBPR Implementation Guidance* (EPA 816-R-01-012), Part II, page II-5, contains the federally reportable violations for the Stage 1 DBPR in detail. These violations are listed by contaminant and violation type. The table includes the SDWIS/FED reporting codes, the regulatory citation, system type affected, a detailed description of the violation, and the initial compliance date. This table will contribute to a user's understanding of those violations listed in SDWIS. Tables 2.1a and 2.1b in Section 2 of this document provide rule specific reporting information. (Please note that in the *Stage 1 DBPR Implementation Guidance* (EPA 816-R-01-012) dated June 2001, Table II-2 does not include violation type 13 and the 27/1008 violation is still included under the 90% Major/Minor structure.)

<u>SDWIS/FED Reporting</u>

The SDWIS/FED reporting requirements apply to systems of all types and sizes. Although the method of violation determination may differ between systems, a particular violation code will define the same type of violation at all systems.

<u>SDWIS/FED Data Transfer File (DTF) Format</u>

Data are reported to SDWIS/FED via a formatted Data Transfer File (DTF). Exhibit 3.1 depicts the format of a DTF transaction.

1-2	3-11	12-18	19-25	26	27-31	32-71	72-74	75-80
Form ID	Qual 1	Qual 2	Qual 3	DIM Code	DE Number	Data Value	Blank	Batch Sequence Number

Form ID	An identification number that allows input of certain types of data.
Qualifier 1	The Public Water System Identifier (PWS-ID) of the Water System to be inserted, modified, or deleted.
Qualifier 2	Contains an ID that further defines what record is to be inserted, modified, or deleted. Qualifier 2 contains the SE ID when reporting facilities and treatments, the violation ID when reporting violations, and the enforcement ID when reporting enforcements.
Qualifier 3	Contains an ID that further defines what record is to be inserted, modified, or deleted. Qualifier 3 contains the treatment ID when reporting treatments.
DIM Code	D= Delete I = Insert M = Modify
DE (Data Element) Number	The DTF data element number (e.g., C0483, C1105) identifying a specific element to be inserted, modified, or deleted.
Data Value	The data value associated with the data element number.
Batch Sequence Number	The number assigned to the group of data being submitted. Used to sequence processing against the database, if required.

Exhibit 3.1 DTF and Transaction Format

Section 4

Additional Sources of Information

This page intentionally left blank

Additional Sources for Technical Information on the Stage 1 DBPR

SDWIS/FED Documents

SDWIS/FED Data Entry Instructions
This document provides details for the creation of all parts of DTF transactions

SDWIS/FED Online Data Dictionary
This application provides details on every table and field contained in SDWIS/FED, including definitions, permitted values, names, and editing requirements.

Technical Information Available on the Stage 1 DBPR

A series of guidance manuals support the Stage 1 DBPR. The manuals will aid EPA, Primacy Agency, and affected PWSs in implementing this rule and will help ensure that implementation among these groups is consistent. Summaries of the manuals and information on how to obtain them are provided below.

Implementation Guidance for the Stage 1 Disinfectants/Disinfection Byproducts Rule (EPA 816-R-01-012)

Objective: To provide guidance to EPA Regions and States exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) concerning how EPA interprets the Stage 1 DBPR under SDWA. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in implementing the statute and regulations. The guidance is designed to implement national policy regarding the Stage 1 DBPR.

Contents: The guidance manual includes four (4) sections, discussing Rule Requirements, SDWIS Reporting, and SNC, State Primacy Revision Applications and other supporting information. It includes six (6) appendices, including a Primacy Revision Crosswalk, Sample Primacy Revision Application Extension Agreement, guidance on adult law issues, a Stage 1 plain English summary, a copy of the Stage 1 DBPR language and example Stage 1 DBPR monitoring forms.

Alternative Disinfectants and Oxidants Guidance Manual (EPA 815-R-99-014)

Objective: To provide technical data and engineering information on disinfectants and oxidants that are not as commonly used as chlorine so that systems can evaluate their options for developing disinfection schemes to control water quality problems such as zebra mussels and Asiatic clams, and oxidation to control water quality problems associated with iron and manganese.

Contents: The manual discusses six disinfectants and oxidants: ozone, chlorine dioxide, potassium permanganate, chloramines, ozone/hydrogen peroxide combinations, and ultraviolet light. A decision tree is provided to assist in evaluating which disinfectant, or disinfectants, is most appropriate given certain site-specific conditions (e.g., water quality conditions, existing treatment, and operator skill). The manual also contains a summary of existing alternative disinfectants used in the U.S. and cost estimates for the use of alternative disinfectants.

MDBP Simultaneous Compliance Guidance Manual (EPA 815-R-99-015)

Objective: To assist PWSs with complying simultaneously with various drinking water regulations (e.g., Stage 1 DBPR, IESWTR, Lead and Copper Rule, and the Total Coliform Rule). The manual discusses operational problems systems may encounter when implementing these rules.

Contents: The manual provides detailed information on the requirements in the Stage 1 DBPR and the IESWTR.

Enhanced Coagulation and Enhanced Precipitative Softening Guidance Manual (EPA 815-R-99-012)

Objective: To assist utilities in implementing, monitoring, and complying with the treatment technique requirements in the final Stage 1 DBPR and to provide guidance to Primacy Agency staff responsible for implementing the treatment requirements.

Contents: The manual provides detailed information on the total organic carbon (TOC) removal requirement, explains how to set an alternative TOC removal percentage under the Step 2 procedure, details monitoring, reporting, and compliance requirements, and discusses strategies that can be employed to mitigate the potential secondary effects on plant performance due to implementation of the treatment technique.

Other Information Sources

Public Notice Handbook (EPA 816-R-00-010)

Objective: To assist water systems in implementing the revised public notification regulation published in the Federal Register on May 4, 2000, (65 FR 25981). The handbook's purpose is to explain EPA's revised public notification rule and provide specific examples of public notices.

Contents: The manual provides a summary of the public notice requirements, and provides detailed examples and explanations of Tier 1, 2 and 3 notice. Templates are provided for specific public notification releases, and to address the special needs of noncommunity systems.

Final Implementation Guidance for the Public Notification Rule (EPA 816-R-01-010)

Objective: To assist States in applying for primacy revision for the Public Notification Rule.

Contents: Information on the primacy revision process - the procedures, timeframes, and content for submission of a State primacy revision application - are outlined in the document. The document also includes the Draft Final Version of SDWIS Reporting in the document's Appendix C.