Reference Guide for the Second Cycle of the Unregulated Contaminant Monitoring Regulation (UCMR 2)

Office of Water
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List of Exhibits

Acronyms

CCL	Contaminant Candidate List
CCR	Consumer Confidence Report
CDX	Central Data Exchange
CFR	Code of Federal Regulations
CI	chemical ionization
CWS	community water system
DBPR	Disinfectants and Disinfection Byproducts Rule (Stage 1 or Stage 2)
DSMRT	distribution system maximum residence time
EPA	United States Environmental Protection Agency
EPTDS	entry point to the distribution system
ESA	ethane sulfonic acid
FR	Federal Register
GC	gas chromatography
GI	gastrointestinal
GLEC	Great Lakes Environmental Center
GUDI	groundwater under the direct influence of surface water
GW	groundwater
LC	liquid chromatography
LFB	laboratory fortified blank
LFSM	laboratory fortified sample matrix
LFSMD	laboratory fortified sample matrix duplicate
MRL	minimum reporting level
MS	mass spectrometry
NCOD	National Drinking Water Contaminant Occurrence Database
NDMA	N-nitroso-dimethylamine
NTNCWS	non-transient, non-community water system
OA	oxanilic acid
PBBE	polybrominatedbiphenyl ether
PN	Public Notification
PWS	public water system

PWSID	public water system identification
QA	quality assurance
QC	quality control
RfD	reference dose
SDWA	Safe Drinking Water Act
SDWARS	Safe Drinking Water Accession and Review System
SDWIS	Safe Drinking Water Information System
SMP	State Monitoring Plan
SPE	solid phase extraction
SW	surface water
UCMR	Unregulated Contaminant Monitoring Regulation
UCMR 1	Unregulated Contaminant Monitoring Regulation, cycle 1
UCMR 2	Unregulated Contaminant Monitoring Regulation, cycle 2

CHAPTER 1. INTRODUCTION AND OVERVIEW

1.1 Document Purpose

This document was developed by the United States Environmental Protection Agency (EPA) to provide an overview of the requirements for public water systems (PWSs) during the second 5-year cycle of the Unregulated Contaminant Monitoring Regulation (UCMR 2), which was published January 4, 2007 (72 FR 368). This document integrates the most essential elements of UCMR 2, including: program design; monitoring and reporting requirements; and the roles and responsibilities of large PWSs (i.e., those serving more than 10,000 people). This document does not focus on small PWS (i.e., those serving less than 10,001 people) requirements in as much detail because EPA is coordinating the small system testing program, providing assistance, and paying for the testing and sample shipping expenses. In addition, this document provides reference to other UCMR resources, accessible through the UCMR 2 Web site. This document briefly describes the Safe Drinking Water Act (SDWA) provisions for the UCMR program and the EPA regulations which establish legally binding requirements. However, this document does not substitute for those provisions or regulations, and does not impose legally-binding requirements on EPA, States, or the regulated PWSs.

1.2 History of the UCMR Program

EPA uses the unregulated contaminant monitoring program to collect data for those contaminants suspected to be present in drinking water that do not have established health-based national standards under the SDWA. The 1986 Amendments to the SDWA established the first requirements to monitor unregulated contaminants with a monitoring program overseen by State primacy agencies from 1988 to 1997.

Through the 1996 amendments to SDWA, EPA established programmatic changes to the unregulated contaminant monitoring program that included: monitoring of no more than 30 analytes in a 5-year cycle; monitoring a representative sample of PWSs serving 10,000 or fewer people (i.e., small systems); and releasing analytical results via the National Drinking Water Contaminant Occurrence Database (NCOD). In 1999, EPA promulgated the rule to support the first cycle (2001-2005) of this revised unregulated contaminant monitoring program (UCMR 1). With the promulgation of UCMR 2, monitoring under the second cycle will start in 2008.

With requirements specified in 40 CFR 141.35 and 141.40, the revised UCMR program is managed as a direct implementation effort by EPA, with state assistance established through Partnership Agreements (PAs).

The UCMR program includes a three-tiered approach to monitoring based on the availability of analytical methods and contaminant prioritization (with known and/or suspected health effects as the top priority):

- **List 1, Assessment Monitoring** targets contaminants with analytical methods that utilize widely available technologies.

- **List 2 Screening Survey** monitoring primarily targets contaminants with analytical methods that generally utilize more sophisticated technology that may not be widely established in drinking water laboratories.
- **List 3 Pre-Screen Testing** is for limited and targeted monitoring of contaminants that require analytical methods that may utilize specialized testing equipment. While part of the overall UCMR design, there currently are no requirements for List 3 Pre-Screen Testing under UCMR 2.

Development of each cycle of the UCMR is done in coordination with the Candidate Contaminant List (CCL) and the NCOD. The data collected through the UCMR program are stored in the NCOD to facilitate review of contaminant occurrence in drinking water. These data may guide the development of subsequent CCLs and ultimately support the EPA Administrator's regulatory determination.

1.3 Overview of UCMR 2

The requirements for the UCMR 2 specify monitoring for 25 contaminants using five analytical methods. The monitoring design established under UCMR 1 remains primarily unchanged, although some modifications incorporated into the program design will improve implementation. Assessment Monitoring (List 1) specifies sampling for 10 contaminants during a 12-month period between January 2008 and December 2010. These List 1 contaminants must be monitored at PWSs that serve more than 10,000 people (approximately 3,500 PWSs), and a representative sample of 800 PWSs that serve 10,000 or fewer people. The Screening Survey (List 2) specifies sampling for 15 contaminants during a 12-month period between January 2008 and December 2010. Monitoring as part of the Screening Survey is required at PWSs serving more than 100,000 people (approximately 400 PWSs) and a representative group of 800 PWSs that serve 100,000 or fewer people. EPA has assigned individual monitoring schedules (year and month of monitoring) for all PWSs subject to the UCMR 2, in coordination with the States. PWSs serving more than 10,000 people will have the ability to change their assigned schedule.

Exhibit 1-1 provides a timeline of UCMR 2 implementation activities.

1.4 Additional Resources

EPA will periodically update the UCMR 2 Web site with the latest information on implementation. For example, EPA will post the latest editions of the UCMR Update newsletter and updated listings of laboratories that become EPA-approved to perform specific methods in support the monitoring effort. To learn more, log-on to:

www.epa.gov/safewater/ucmr/ucmr2/index.html

Exhibit 1-1: Timeline of UCMR 2 Activities

<table>
<tr><th>2006 and 2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th></tr>
<tr><td rowspan="4">EPA program preparation:
❖ Establish State Partnership Agreements
❖ Implement EPA Lab Approval Program
❖ Develop Draft State Monitoring Plans (SMPs)
➢ Identify applicable PWS
➢ Select representative PWS
➢ Define PWS monitoring schedules
❖ Submit Draft SMPs to Partnered States for Review
❖ Refine Sample Location Inventory
➢ Review UCMR 1 inventory and supplement with available SDWIS information
➢ Request updated system inventory from partnered states
❖ Upgrade SDWARS for UCMR 2</td><td colspan="3">Assessment Monitoring:
10 List 1 Contaminants; 2 EPA Methods
All systems serving more than 10,000;
800 systems serving less than 10,001 people</td><td></td></tr>
<tr><td colspan="3">Screening Survey:
15 List 2 Contaminants; 3 EPA Methods
All systems serving more than 100,000 people;
800 systems serving less than 100,001 people</td><td></td></tr>
<tr><td colspan="3" rowspan="2">EPA assesses data quality/analyzes results</td></tr>
</table>

CHAPTER 2. SYSTEMS SUBJECT TO UCMR 2

UCMR 2 lists specific criteria that determine whether systems are subject to the regulation (Assessment Monitoring and/or Screening Survey), or if they are eligible to be included as part of a randomly selected national sample of PWSs. This chapter explains these criteria.

2.1 System Applicability

The applicability of the UCMR 2 monitoring requirements to a PWS is a function of water system type and total population served. Community water system (CWS) and non-transient non-community water system (NTNCWS) types are subject to the monitoring requirements based on total population served, as follows,

- Assessment Monitoring (List 1) is required at:
  - all PWSs serving more than 10,000 people
  - a nationally representative sample of 800 systems serving less than 10,001 people.
- Screening Survey (List 2) is required at:
  - all PWSs serving more than 100,000 people
  - a nationally representative sample of 320 PWSs serving between 10,001 and 100,000 people
  - a nationally representative sample of 480 PWSs serving less than 10,001.

Transient non-community water systems, and CWSs or NTNCWSs that purchase <u>all</u> of their finished water from another system, are not subject to the rule.

Under UCMR 2, June 30, 2005 is the fixed applicability date and any PWS that met the applicability criteria as of this date is subject to the UCMR 2 requirements. For example, if a PWS's population served as of June 30, 2005 was 9,000, then that system would qualify for possible selection as part of the national sample of systems serving less than 10,001 people. However, if the PWS's population served was 11,000 as of June 30, 2005, then the system would be required to conduct Assessment Monitoring (List 1), and would qualify for possible selection for the Screening Survey (List 2) as part of the representative sample of PWS serving between 10,001 and 100,000.

2.1.1 How did EPA Calculate Total Population Served?

Under UCMR 2, **total population served** is the sum of the direct retail population served plus the population served, if any, by any consecutive system(s) receiving its finished water from the wholesaler PWS. **Finished water** is water introduced into a distribution system and intended for distribution and consumption without further treatment (except treatment as necessary to maintain water quality in the distribution system, such as booster disinfection, or addition of corrosion control chemicals).

2.2 Representative Sample Design

In designing the nationally representative sample of PWSs for Assessment Monitoring and the Screening Survey, EPA accounted for a list of key system characteristics, including:

- System size (population served);
- Source of water supply (groundwater or surface water); and
- Geographic location (State or Territory).

In addition, EPA further divided the small system category into three separate size strata and the large system category into two (see Exhibit 2-1). Stratification of the sample set across these categories allows EPA to consider differences in exposure risks.

2.2.1 What Was EPA's Rationale for the UCMR 2 Sample Design?

All systems serving more than 10,000 people and a representative sample of 800 systems serving less than 10,001 people must conduct Assessment Monitoring (List 1). The size of the stratified random sample allows for a high level of confidence in the resulting monitoring data and low error or uncertainty within the sample. EPA believes that combining a nationally representative sample of smaller PWSs with a census of the larger PWSs yields a powerful dataset for assessing contaminant occurrence in drinking water.

All systems serving more than 100,000 people and a representative sample of 800 systems serving less than 100,001 people must conduct the Screening Survey (List 2). Because the analytical methods for the Screening Survey (List 2) contaminants utilize newer analytical technologies, the Screening Survey sample size is smaller than Assessment Monitoring (List 1) in order to ensure sufficient laboratory capacity. Using a census of those PWSs that serve over 100,000 will minimize the possibility of overlooking contaminant occurrence in the drinking water of those systems that serve the largest portion of the population, while keeping the number of systems required to conduct the Screening Survey lower.

2.3 System Participation

Exhibit 2-1 lists the number of PWSs expected to monitor under UCMR 2 by system size. EPA believes a total of approximately 4,700 systems are subject to UCMR 2. The majority of systems that will participate in UCMR 2 are systems that serve more than 10,000 people.

Exhibit 2-1: Approximate Number of PWSs Subject to UCMR 2			
Total population served	**Assessment Monitoring (List 1) Systems**	**Screening Survey (List 2) Systems**	**Total UCMR 2 Systems, by size**
25 to 500	109	160	269
501 to 3,300	307	160	467
3,301 to 10,000	384	160	544
Subtotal: 25 to 10,000 people served	*800*	*480*	*1,280*
10,001 to 50,000 [1]	~ 2,600	*subset of* 160	~ 2,600
50,001 to 100,000 [1]	~ 450	*subset of* 160	~ 450
Subtotal: 10,001 to 100,000 people served	*~ 3,050*	*subset of 320*	*~ 3,050*
Over 100,000 people served [2]	*~ 400*	*~ 400*	*~ 400*
Total UCMR 2 Systems, by monitoring component	*~ 4,250*	*~ 1,200*	*~ 4,730*

[1] PWSs serving between 10,001 and 100,000 people must conduct Assessment Monitoring (List 1), a subset of 320 of these systems are selected to also conduct Screening Survey (List 2) monitoring. Approximately 3,050 systems in this size category will participate in UCMR 2.

[2] PWSs serving more than 100,000 people must conduct both Assessment Monitoring (List 1) and Screening Survey (List 2) monitoring. Approximately 400 of these largest systems will participate in UCMR 2.

Note: The number of PWSs is approximate for those size categories where PWSs serve more than 10,000 because over the course of UCMR 2 implementation, some PWS may merge or close and thus will no longer be subject to monitoring.

CHAPTER 3. CONTAMINANTS TO BE MONITORED

UCMR 2 specifies monitoring for 25 contaminants, using 5 EPA methods for analysis. These 25 contaminants were chosen from an initial list of over 200, compiled from a variety of different sources, including: UCMR 1 reserved contaminants; Candidate Contaminant List 1 (CCL 1) "deferred pesticides"; CCL 1 suspected endocrine disruptors; and other emerging contaminants. EPA implemented a multi-step review and prioritization process which led to a proposed UCMR 2 analyte list of 26 contaminants published in the *Federal Register* in August 2005 (70 FR 49094). Based on public comment and further consideration, EPA refined the list to 25 contaminants. Included in UCMR 2 are two tiers of monitoring: Assessment Monitoring (List 1) and Screening Survey (List 2).

3.1 Assessment Monitoring (List 1)

Assessment Monitoring (List 1) is required for 10 contaminants using two analytical methods that rely on technologies that are common in drinking water laboratories. The contaminants fall into two main groups:

- *Flame retardants and other priority contaminants*: EPA is requiring monitoring for five flame retardants, as well as the insecticide dimethoate and a degradate of the insecticide terbufos, known as terbufos sulfone, using EPA Method 527 for analysis.
- *Explosives*: EPA is requiring monitoring for three explosives: hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), 1,3-dinitrobenzene, and 2,4,6-trinitrotoluene (TNT), using EPA Method 529 for analysis.

Exhibit 3-1 lists the Assessment Monitoring (List 1) contaminants, their minimum reporting limits (MRLs), methods, use or environmental sources, and health effects.

Exhibit 3-1: UCMR 2 List 1 Contaminants

Contaminant/ CASRN[1]	MRL (µg/L)	EPA Method[2]	Use or Environmental Source	Health Effects[3]
1 Insecticide and 1 Insecticide Degradate				
Dimethoate 60-51-5	0.7	527	Insecticide used on cotton and other field crops, orchard crops, vegetable crops, in forestry, and residential uses	EPA classified as a "possible human carcinogen," with a reference dose (RfD) of 0.0002 milligrams per kilogram per day (mg/kg/day)
Terbufos sulfone 56070-16-7	0.4		Parent compound, terbufos, used for systemic control of soil-borne insects and nematodes in fields of corn, grain sorghum, and sugar beets	EPA derived chronic RfD of 0.00005 mg/kg/day for the parent compound, terbufos, based on a no observed adverse effect level (NOAEL) for plasma cholinesterase inhibition
5 Flame Retardants				
2,2',4,4'-tetrabromodiphenyl ether (BDE-47) 5436-43-1	0.3	527	Flame retardants added to plastics (for products such as computer monitors, televisions, textiles, and plastic foams)	Animal studies suggest thyroid and liver effects, as well as possible reduced immune system function and neurobehavioral alteration
2,2',4,4',5-pentabromodiphenyl ether (BDE-99) 60348-60-9	0.9			
2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153) 68631-49-2	0.8			
2,2',4,4',6-pentabromodiphenyl ether (BDE-100) 189084-64-8	0.5			
2,2',4,4',5,5'-hexabromobiphenyl (HBB) 59080-40-9	0.7		Flame retardant additive; production of PBBEs ended in 1976 in US after an incident of significant accidental agricultural contamination in 1973	
3 Explosives				
2,4,6-trinitrotoluene (TNT) 118-96-7	0.8	529	Used as an explosive in bombs and grenades, also used as a propellant; small amounts used for industrial explosive applications, such as deep well and underwater blasting; chemical intermediate in manufacture of dyestuffs and photographic chemicals	EPA classified as possible human carcinogen (Group C) based on urinary bladder papilloma and carcinoma in female rats and activity in Salmonella, with and without metabolic activation
1,3-dinitrobenzene 99-65-0	0.8		Used in explosives; also formed as a by-product during the manufacture of the explosive trinitrotoluene (TNT); used in the manufacture of aramid fibers, spandex, and dyes	EPA derived chronic oral RfD of 0.0001 mg/kg/day, based on increased spleen weight
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) 121-82-4	1.0		Used in detonators, primers, mines, rocket boosters, and plastic explosives; also used in fireworks and demolition blocks, and as a rodenticide	EPA derived chronic oral RfD of 0.0003 mg/kg/day, based on prostate inflammation observed in rats in a 2-year feeding study, and has been classified as a possible human carcinogen (Group C), based on adenomas and carcinomas in female mice

[1] Chemical Abstracts Service Registry Number.

[2] See Exhibit 5-3 for more information about these approved analytical methods and their availability.

[3] Unregulated Contaminant Monitoring Regulation (UCMR) for Public Water Systems Revisions; Proposed Rule. Fed. Reg. Vol. 70, No. 161. p. 49093, August 22, 2005.

3.2 Screening Survey (List 2)

Screening Survey (List 2) requires monitoring for 15 List 2 contaminants using three analytical methods that are more specialized and rely on more recent technologies that are not as common in drinking water laboratories. The contaminants fall into two main groups:

- *Acetanilide pesticides and their degradation products*: EPA is requiring monitoring for the three highest-use parent acetanilide compounds, acetochlor, alachlor, and metolachlor using EPA Method 525.2, and their ethane sulfonic acid (ESA) and oxanilic acid (OA) degradation products using EPA Method 535. Concurrent collection of samples for the acetanilide parent compounds and their degradation products will allow the calculation of total acetanilide compounds.
- *Nitrosamines/NDMA*: EPA is requiring monitoring for six nitrosamines using EPA Method 521 for analysis.

Exhibit 3-2 lists the Screening Survey (List 2) contaminants to be monitored, their MRLs, methods, use or environmental sources, and health effects.

3.3 Pre-Screen Testing (List 3)

While Pre-Screen Testing (List 3) continues to be as option as part of the UCMR design, no monitoring is currently required under UCMR 2.

Exhibit 3-2: UCMR 2 List 2 Contaminants

Contaminant/ CASRN[1]	MRL (µg/L)	EPA Method[2]	Use or Environmental Source	Health Effects[3]
3 Acetanilide Parent Herbicides and 6 Acetanilide Herbicide Degradates				
Acetochlor 34256-82-1	2.0	525.2	Used as an herbicide on corn	EPA reference doses (RfDs) is 0.02 milligrams per kilogram per day (mg/kg/day)
Alachlor 15972-60-8	2.0		Widely used herbicide, primarily used in the Midwest to control annual grasses and broadleaf weeds on crops such as corn, sorghum, and soybeans	EPA RfD is 0.01 mg/kg/day
Metolachlor 51218-45-2	1.0		Broad spectrum herbicide used for general weed control in non-crop areas; widely used on crops such as corn, cotton, peanuts, grass for seed production, nurseries, hedgerows/fencerows, and landscape plantings	EPA RfD is 0.15 mg/kg/day
Acetochlor ethane sulfonic acid (ESA) 187022-11-3	1.0	535	Degradation products of acetochlor	EPA RfD for parent herbicide (acetochlor) is 0.02 mg/kg/day
Acetochlor oxanilic acid (OA) 184992-44-4	2.0			
Alachlor ESA 142363-53-9	1.0		Degradation products of alachlor	EPA RfD for parent herbicide (alachlor) is 0.01 mg/kg/day
Alachlor OA 171262-17-2	2.0			
Metolachlor ESA 171118-09-5	1.0		Degradation products of metolachlor	EPA RfD for parent herbicide (metolachlor) is 0.15 mg/kg/day
Metolachlor OA 152019-73-3	2.0			
6 Nitrosamines				
N-nitroso-diethylamine (NDEA) 55-18-5	0.005	521	Nitrosamines can form as intermediates and byproducts in chemical synthesis and manufacture of rubber, leather, and plastics; can form spontaneously by reaction of precursor amines with nitrosating agents (nitrate and related compounds), or by action of nitrate-reducing bacteria. Foods such as bacon and malt beverages can contain nitrosamines; there also is evidence that they form in the upper GI tract	EPA considers all six compounds to be probable human carcinogens
N-nitroso-dimethylamine (NDMA) 62-75-9	0.002			
N-nitroso-di-n-butylamine (NDBA) 924-16-3	0.004			
N-nitroso-di-n-propylamine (NDPA) 621-64-7	0.007			
N-nitroso-methylethylamine (NMEA) 10595-95-6	0.003			
N-nitroso-pyrrolidine (NPYR) 930-55-2	0.002			

[1] Chemical Abstracts Service Registry Number.

[2] See Exhibit 5-3 for more information about these approved analytical methods and their availability.

[3] Unregulated Contaminant Monitoring Regulation (UCMR) for Public Water Systems Revisions; Proposed Rule. Fed. Reg. Vol. 70, No. 161. p. 49093, August 22, 2005.

CHAPTER 4. SAMPLE COLLECTION REQUIREMENTS

Under UCMR 2, PWSs must meet specific requirements regarding when, where, and how to sample. EPA will instruct and assist small water systems with their monitoring requirements. Therefore, this chapter provides guidance to large systems for meeting their monitoring requirements.

4.1 Timing of Monitoring

The PWS will be required to collect samples during a specific time frame and frequency as explained in more detail in this section.

4.1.1 When Is Monitoring Required?

Assessment Monitoring for List 1 contaminants and Screening Survey Monitoring for List 2 contaminants is required during a consecutive 12-month period between January 2008 and June 2010.

For all PWSs subject to UCMR 2 monitoring, EPA has assigned monitoring schedules for each sampling location and respective of the monitoring requirement (i.e., Assessment Monitoring and Screening Survey). PWSs can review their monitoring schedule(s) using their Central Data Exchange (CDX) account to access the Safe Drinking Water Accession and Review System (SDWARS). See Chapter 6 for more details on the SDWARS reporting system.

4.1.2 Will EPA Set Different Sampling Schedules for Different Locations at a Particular PWS?

No, EPA will assign the same initial sampling month for all sampling locations at a PWS. If different water types are used at various treatment plant facilities within the PWS (i.e., GW vs. SW), the frequency will be adjusted based on the different requirements, but the initial month will be consistent.

4.1.3 Can a PWS Request a Different Schedule?

Yes, a PWS can request a schedule change for any or all sampling locations and for the different monitoring requirements (i.e., Assessment Monitoring and Screening Survey) at those locations. The PWSs has two different ways to request a change in schedule if monitoring cannot be conducted according to the EPA-assigned schedule.

The procedure for requesting a change in a monitoring schedule depends on the timing of the request.

- If the request for a monitoring schedule change is **within 210 days** of the publication of the final UCMR 2 (i.e., by August 2, 2007), the PWS can enter the revised schedule into SDWARS via their CDX account. The schedule that is specified in SDWARS on

August 2, 2007 will become the established monitoring schedule for the PWS, which EPA will use to track compliance.

- If the request for a monitoring schedule change occurs **more than 210 days past** the publication of the final UCMR 2 (i.e., after August 2, 2007)**,** submit a written request to the UCMR Sampling Coordinator by mail, e-mail, or fax (see Section 7.4). The PWS should specify the reason for the requested change (e.g., budgetary problems, well closings) and suggest a revised monitoring schedule. However, unless and until the PWS receives a letter from EPA specifying a new monitoring schedule, the PWS must sample according to the established monitoring schedule.

4.1.4 What If a PWS Misses a Sampling Event Due to Some Unforeseen Problem?

EPA anticipates that often, PWSs will have advance knowledge of a potential sampling problem that may impact the monitoring schedule, affording the PWS time to request a revised schedule, prior to the sampling deadlines. However, EPA also realizes that unforeseen events (e.g., a well pump breaking, natural disaster) may not afford sufficient time to make this request. In these instances, an explanation of the situation must be recorded in SDWARS within 30 days of the unexpected change, for each location in which monitoring could not be conducted (§141.35(c)(2)). The PWS should not only include an explanation of the problem, but also note how and when make-up samples will be collected. Such sampling should occur as soon as is practical.

4.1.5 Does the Source Water Type Impact How a PWS Must Monitor?

Yes. Sample points with a surface water source or groundwater under the direct influence of surface water (GUDI) source are subject to quarterly monitoring, and those served by groundwater sources must be monitored twice, 5 to 7 months apart, during the consecutive 12-month period. ***Please note that monitoring may span over two calendar years.***

Water source types are classified as:

- **Surface Water** if some or all of the water comes from a surface water source any time during the designated 12-month monitoring period.

- **GUDI** if some or all the water comes from a GUDI source any time during the designated 12-month monitoring period and at no time is the source considered surface water.

- **Groundwater** if all the water comes from a groundwater source during the entire designated 12-month monitoring period.

Sampling events must occur at certain intervals throughout the scheduled monitoring:

- **Monitoring from locations which utilize a surface or a GUDI source**. The quarterly sampling events must occur three months apart. In other words, monitoring can start within any of the following months and then must continue for the subsequent months within the groups of: (1) January, April, July, October; (2) February, May, August, November; or (3) March, June, September, December.

- **Monitoring from locations which utilize a groundwater source.** The two sampling events must occur 5 to 7 months apart. To provide flexibility, EPA is allowing this 3-month window to collect the second sample, because some groundwater systems have multiple wells, or wells that do not operate continually. Though EPA will schedule sampling events as occurring 6 months apart, this is for planning purposes only. The PWS will have met the monitoring schedule if they collect the second sample within 5 to 7 months of the first scheduled sample. For example, if collection of the first sample is during February 2008, the PWS must collect the second sample in June, July, or August of 2008.

4.1.6 Is Monitoring Required at Emergency Sources?

No, monitoring does not need to be conducted at emergency sources.

4.2 Sampling Locations

4.2.1 Where Are Assessment Monitoring (List 1) Samples Collected?

Assessment Monitoring (List 1) samples are collected at the entry point(s) to the distribution system (EPTDSs). PWSs may collect "raw source water" samples **only in those instances** where groundwater enters the distribution system untreated at the EPTDS. (This is a change from UCMR 1. Under UCMR 2, source water sampling is not permitted when treatment is applied.)

4.2.2 Where Are Screening Survey (List 2) Samples Collected?

Screening Survey (List 2) samples are collected at the EPTDSs for all List 2 contaminants. For those systems that utilize chemical disinfection (i.e., subject to 40 CFR 141.132(b)(1)), additional samples must be collected for nitrosamines (EPA Method 521.0) at the distribution system maximum residence time (DSMRT) sampling point, associated with each plant/water source, as defined in the Stage 1 Disinfectants and Disinfection By-Products Rule (DBPR) (§141.132(b)(1)(i)). [EPA is requiring nitrosamines to be measured at two locations to aid in understanding the proportion of nitrosamines, particularly N-nitroso-dimethylamine (NDMA), that result from source water contamination versus that which results from disinfection.]

4.2.3 Do PWSs Need to Collect Samples at Every EPTDS?

If the PWS uses groundwater as a source and has multiple EPTDSs that have been documented

as representing the same source water, a groundwater representative monitoring plan can be submitted to EPA within 120 days of the publication of the final UCMR 2 (i.e., by May 4, 2007). Refer to Section 6.2.2 in Chapter 6 for a discussion of the criteria and documentation that must be provided to EPA. Unless such a plan is approved, the PWS must collect from all EPTDS that represent each non-emergency water source.

4.3 Sample Collection Procedures

Procedures for sample collection under UCMR 2 are contaminant and method specific. The PWS, as the regulated entity, has the responsibility to ensure the proper collection and submission of samples to EPA-approved UCMR 2 laboratories. Laboratories approved by EPA have submitted method-specific application packages to EPA, and have successfully completed a Proficiency Testing (PT) study for those methods. Chapter 5 provides guidance on how to procure laboratory services, if your state is not coordinating sample collection. (Inquires regarding your state's level of participation should be directed to your state drinking water program.) For a list of approved laboratories and the methods for which they have received approval, refer to http://www.epa.gov/safewater/ucmr/ucmr2/labs.html.

4.3.1 What Specific Sampling Procedures Should be Followed?

Specific timing and procedural steps must be followed when collecting samples. Timing issues that should be considered include the following:

- Collect the samples early enough in the day to allow time for overnight delivery to the laboratories.
- Collect samples only Monday through Thursday. Collection on Friday, Saturday, or Sunday may not allow samples to be shipped and received at the laboratory at the required temperature unless special arrangements have been made with the laboratory to receive the samples.
- Collect samples for acetanilide parents and their degradation products on the same day *(applies only to systems that are part of the Screening Survey)*.

PWSs will often collect these samples. If this is the case, the laboratory will generally send a sampling kit that will include sampling instructions and sample bottles with required preservatives. Procedural steps to keep in mind include:

- Use a fresh pair of disposable latex gloves at each sampling location to prevent cross-contamination.
- Collect EPTDS or DSMRT samples from a spigot, faucet, or tap, never through a hose.
- Open the tap and allow the system to flush until the water temperature has stabilized. Collect the sample by filling the sample bottle to the neck but not overflowing. Be careful not to flush out the sample preservation reagents. ***Do not composite samples – each must be collected separately.***
- Cap each bottle and gently invert three or four times to mix the dechlorinating agent. (DO NOT SHAKE).

- If collecting samples for acetochlor, alachlor, and metolachlor (EPA Method 525.2), the 1-liter glass sampling bottle provided by the laboratory will contain a small quantity (~50 mg) of sodium sulfite to serve as a dechlorinating agent/preservative. Additional EPA Method 525.2 sample collection steps include:
    - After the dechlorinating agent has dissolved, wait one minute, open the bottles, and add 4 mL of 6N HCl (which the laboratory should also provide in the sampling kit) to each 1 liter sample bottle. (CAUTION: Handle the acid very carefully. Wear safety glasses and latex gloves.)
    - Cap each sample bottle tightly, and gently invert it three or four times to mix.
    - Carefully and slowly open the sample bottle to release any pressure (carbon dioxide gas resulting from interaction of HCl with carbonate salts potentially present in the sample), then re-cap the bottle and place it back into the laboratory supplied sampling kit.
- Fill out sample labels and all field sampling forms.
- After collecting samples, they may initially be chilled in a refrigerator, particularly if sample collection is during summer and the ambient temperature of the samples at time of collection exceeds 20°C (68°F). This will help ensure that the ice or chemical freeze packs will keep the samples below 10°C (50°F) during shipment to the laboratory within the first 48 hours after collection. Samples may not exceed 10°C (50°F) upon delivery to the laboratory, after which they must be stored at less than 6°C.

4.3.2 What If Samples Do Not Arrive at the Proper Temperature?

The laboratory MUST reject any sample that exceeds 10°C (50°F) once it arrives at the laboratory. Samples that fail this temperature requirement are invalid. The laboratory must contact the PWS about recollection of any sample(s) from those same location(s) and may discuss adjusting sample shipping protocol or other precautionary steps (e.g., chilling samples prior to shipment, extending the freeze time for chemical freeze packs, using more ice/chemical freeze packs, etc.). This sample recollection must be within 30 days of laboratory notification of the invalidated samples, although your PWS should strive to recollect the samples as soon as possible.

4.3.3 Is Improper Sample Temperature the Only Reason for Sample Recollection?

No, recollection should occur for any sample that fails to meet the UCMR 2 sample collection or analytical quality control requirements. In addition, recollection must occur if a sample container is lost, damaged during shipping, broken during processing at the lab, or if a sample result is subject to laboratory error. Recollection should be as soon as possible, but must be within 30 days of lab notification of the sampling or laboratory error. EPA strongly encourages the concurrent collection and shipment of additional samples for your laboratory to have available "back-up" samples from each sampling location. This often eliminates the need to recollect samples in the event an individual sample is lost (e.g., accidental bottle breakage) or sample result is subject to laboratory error.

CHAPTER 5. CONTRACTING FOR LABORATORY SERVICES

Most PWSs will need to establish laboratory contracts for UCMR 2 laboratory services with one or more EPA-approved laboratories. Specific information for large systems to follow when procuring laboratory services for the required UCMR 2 analyses is detailed in this chapter. If your PWS is in a state that is responsible for coordinating the collection and analysis of National Primary Drinking Water Standard (NPDWS) compliance monitoring samples, your state may be playing an active role in assisting your PWS with the collection and analysis of UCMR 2 samples. If you expect that this is the case, yet the state has not contacted your PWS, we recommend that you contact your state drinking water program or the UCMR Message Center (800-949-1581). If your state is not playing an active role, you will need to procure the required analytical services as detailed in this chapter.

5.1 The Basics of Contracting with a UCMR 2 Laboratory

This section covers the basic items the PWS needs to know to find and establish a contract with a UCMR 2 laboratory.

5.1.1 Which Laboratories Are Approved for UCMR 2 Testing?

PWSs must use laboratories approved by EPA for UCMR 2 testing. A list of EPA-approved laboratories and the methods for which they have approval, is available at http://www.epa.gov/safewater/ucmr/ucmr2/labs.html.

5.1.2 What If a Laboratory Has EPA Approval in Some But Not All UCMR 2 Methods?

Laboratories can have EPA approval for one or all five methods. PWSs subject only to Assessment Monitoring (List 1) need to collect samples for EPA Methods 527 and 529. PWSs subject to both Assessment Monitoring (List 1) and the Screening Survey (List 2) need to collect samples for EPA Methods 527, 529, 521, 525.2 and 535. PWSs must first recognize what monitoring requirements apply to their system before soliciting bids from laboratories. If a PWS has an established contract with a preferred lab that is not EPA-approved or is only EPA-approved in a subset of methods they require, there are three options:

- Establish a new contract with a second laboratory that has EPA approval for those methods that the preferred laboratory cannot conduct.

- Request that the preferred laboratory subcontract to an EPA-approved laboratory for those methods in which they do not have EPA approval, thus the preferred lab serves as the prime contract lab. In this case, the EPA-approved subcontract lab must post the monitoring data to SDWARS.

- Establish a contract with a different lab that can fully meet your UCMR 2 analytical requirements.

5.2 Defining the PWS's Requirements and Developing a Contract

The best way to ensure the PWS receives the data needed for UCMR 2 monitoring within the required time period is to specify the requirements *in detail* in the contract. A well-written contract can minimize or eliminate many common problems in procuring analytical services, and enable you to collect reliable and timely results. Recommendations on the factors to consider in defining the scope of the services you need, and the information you should include in your contract, are provided below.

PWSs subject to the UCMR 2 monitoring requirements should address the following questions and relay these requirements to their laboratory(ies).

5.2.1 Which tier of monitoring applies?

- **Only** Assessment Monitoring (List 1) contaminants (EPA Methods 527.0 and 529.0)

OR

- **Both** Assessment Monitoring (List 1) and Screening Survey (List 2) contaminants (EPA Methods 527.0, 529.0, 521.0, 525.2 and 535.0)

5.2.2 Where do samples need to be collected?

- **All** EPTDSs for Assessment Monitoring (List 1)

AND

- **All** EPTDSs for those PWSs also subject to the Screening Survey (List 2) plus additional samples for nitrosamines (EPA Method 521.0) from DSMRT sampling locations associated with each plant/water source, as defined in the Stage 1 DBPR (§141.132(b)(1)(i)).

5.2.3 How often must samples be collected (i.e., frequency)?

- Facilities with either SW or GUDI as their water type must monitor quarterly for four consecutive quarters within a 12-month period.

- Facilities with GW as their water type must monitor twice, 5 to 7 months apart within a 12-month period.

It is important to note that some PWSs may have combinations of facilities using different water types that have different sampling frequency requirements. Also, some facilities at PWSs that mix GW with any portion of SW or GUDI must monitor for four consecutive quarters (i.e., as if they were a SW or GUDI facility) within a 12-month period.

5.2.4 What is the monitoring schedule?

EPA has established a monitoring schedule for all PWSs in SDWARS at the facility level and respective of the monitoring tier required. PWSs need to have a user account in CDX for SDWARS to access, review, and if desired, revise this monitoring schedule (see Chapter 6). [NOTE: When reviewing the monitoring schedule, the PWSs must also carefully review the

sampling location inventory for the PWS. The PWSs must add, correct or edit any EPTDS or DSMRT location which is: improperly identified; missing inventory information; or incorrectly listed. You must address these issues in order for your PWS to comply with the UCMR 2 requirements.]

5.2.5 How many samples should the laboratory expect to receive?

The number of samples depends upon which tier of monitoring is required at the PWS (i.e., only List 1 or both List 1 and List 2), the water type at the various facilities at the PWS, and the number of locations that must be sampled. For example, if a system serves over 100,000 (or between 10,000 and 100,000 and is selected for List 2) they must conduct analyses for all five methods under both List 1 and List 2. If they happen to have both a surface water treatment plant (EPTDS #1) and a groundwater treatment plant (EPTDS#2), these two EPTDS would be sampled for all five methods, with EPTDS#1 sampled quarterly for four consecutive events, and EPTDS#2 sampled twice, 5 to 7 months apart. They will also have two DSMRT locations (DSMRT#1 for SW and DSMRT#2 for GW), respective of these two unique water sources, where they will collect samples for nitrosamines following the same frequency respective of the source water type. For this system, the array of samples is shown in Exhibit 5-1.

Exhibit 5-1: Example array of samples

Facility	Calculation of sample sets required	# of sample sets
SW EPTDS #1	5 methods x 4 quarterly events	20
SW DSMRT #1	1 method x 4 quarterly events	4
GW EPTDS #2	5 methods x 2 semi-annual events	10
GW DSMRT #2	1 method x 2 semi-annual events	2
	Base total number of samples expected	36

5.2.6 What are the types of samples processed at the laboratory?

- **Field Samples (billable samples)** are those samples collected and analyzed for the PWS and typically are the only samples that are billable. ***Though not required under UCMR 2, EPA recommends that each of these samples be collected in duplicate***; that is, have your laboratory provide an additional collection bottle such that you can collect a second sample for the laboratory to use in case of breakage during transit or handling, or in the event of QC problems at the laboratory. It is worthwhile to discuss specific sample volume needs with your contract laboratory(ies). Also, laboratories may request you collect additional sample replicates from some locations to ensure that they have sufficient volume to conduct laboratory fortified sample matrix (LFSM) and LFSM duplicate (LFSMD) analyses as part of their required QC protocols. Typically, these additional samples are not billable, unless the PWS specifically wishes to have a percentage of their samples utilized as the LFSM/LFSMD pair.

- **Internal Laboratory QC Samples (non-billable samples)** include method blanks and on-going precision and recovery samples (e.g., LFBs) that are required when the

laboratory conducts the method, but apply to multiple PWS clients. Rather than charging individual clients for these QC samples directly, laboratories typically distribute the costs of these samples across their per sample rates.

- **Replacement Samples** may be required if a sample is collected without a duplicate, and the laboratory data does not meet the required QC criteria or the PWS does not follow the required sampling procedures. You should discuss these contingencies with your contract lab. Additionally, many PWSs stipulate in their contracts that if the laboratory does not meet required QC criteria and it is not based on PWS sampling error, reanalysis of the sample (if sufficient sample volume remains and holding times are not exceeded) or collection and analysis of a replacement sample, will be performed at no additional cost to the PWS. One notable exception pertains to the accuracy and precision results obtained from the LFSM and LFSMD. UCMR 2 does not specify performance criteria for the UCMR 2 contaminants fortified in the LFSM and LFSMD samples, therefore, LFSM and LFSMD samples that do not meet those method specified acceptance criteria are still valid, and the samples do not need to be re-analyzed. These LFSM and LFSMD results must be reported by the laboratory to SDWARS.

5.2.7 What Sample Volume Is Required?

Each of the UCMR 2 methods specifies the sample volume that is required for each analysis. Laboratories typically supply their client PWSs all the sample bottles, required preservatives, and associated sampling supplies within a sampling kit, for each sample location. Laboratories may also request, from their client PWSs, additional samples for the laboratory to prepare the LFSM and LFSMD samples. Exhibit 5-2 identifies the minimum sample volumes the laboratories should request when collecting samples. PWSs should confirm the contract laboratory will be obtaining sample volumes that meet these minimum volume requirements.

Exhibit 5-2: Sample Collection Volumes

Requirement Tier	EPA Method	Minimum Sample Volume Required (for an individual sample)
Assessment Monitoring (List 1)	527.0	1 liter
	529.0	1 liter
Screening Survey (List 2)	521.0	0.5 liter (though EPA recommends 1 liter)
	525.2	1 liter
	535.0	250 milliliters

5.3 Quality Control Requirements for Laboratories

Most quality control (QC) requirements are specific to the analytical methods approved under UCMR 2; however, in some cases, the UCMR 2 specifies additional QC requirements that laboratories must meet. The UCMR 2 QC requirements have been detailed in correspondence issued to laboratories through the EPA Laboratory Approval Program. PWSs should incorporate, within their laboratory contract terms, a requirement that along with all analytical results reported, the laboratory certifies that these data meet or exceed all required QC, as specified in the UCMR 2 Laboratory Approval Manual (supporting the final Rule).

Some of these QC requirements include:

- **Sample preservation –** sample kits sent to the PWS included the proper preservation.

- **Sample temperature, storage, and holding time –** samples were received at the laboratory in good condition (i.e., within 48 hrs and at or below 10°C [50°F]), stored at the laboratory at less than 6°C, and extracted and analyzed within method prescribed holding times.

- **Initial and Continuing Calibration Check Standards –** the laboratory validated their calibration curve, which is used to quantify any analyte response in the field samples, and it met acceptance criteria. The laboratory analyzed an initial calibration check standard prior to any field sample analyses at a concentration at or below the statutory MRL. Also, the laboratory analyzed continuing calibration check standards after every 10^{th} field sample analysis.

- **Daily Performance Checks** – a laboratory fortified blank (LFB) was prepared at or below the statutory MRL, extracted and analyzed with each batch of samples.

- **LFSM and LFSMD** – the laboratory prepared, extracted, and analyzed a LFSM and LFSMD pair with every 20 samples or with each extraction batch, whichever was more frequent. The results of these analyzes may be requested but the samples used to prepare the fortified sample may not have been collected from your PWS.

5.4 Analytical Methods Approved for UCMR 2

UCMR 2 specifies five analytical methods: two for Assessment Monitoring contaminants (Methods 527 and 529) and three for Screening Survey contaminants (Methods 535, 525.5, and 521). Method-specific quality assurance/quality control (QA/QC) requirements can be found in the method documents referenced in Exhibit 5-3.

EPA must approve analytical laboratories that wish to perform UCMR 2 analyses. These EPA-approved laboratories will have demonstrated an understanding of the QC requirements of

UCMR 2 and the associated analytical methods. PWSs should recognize that some laboratories will only have EPA approval for some methods, and will not be EPA-approved for all five UCMR 2 methods. The PWSs should keep this in mind when selecting and soliciting bids from laboratories. This issue can easily be resolved by either contracting with more than one UCMR 2 approved laboratory, or by having a single laboratory subcontract the analyses to one or more other UCMR 2 approved laboratory(ies) (see section 5.1.2). You should include in your contract with the laboratory(ies) language that clarifies:

- the laboratory conducting the analysis must post their data to SDWARS.

- Laboratories can only post data to SDWARS for those UCMR 2 methods for which they have EPA approval.

If the PWS utilizes a prime contract laboratory that subcontracts any UCMR 2 analyses to EPA-approved laboratories, the prime contract laboratory should ensure that their subcontract labs are also fully aware of these requirements.

Exhibit 5-3: Analytical Methods Approved for UCMR 2 Monitoring		
Analytical Method	**Method Document/Internet Link**	**Contaminants**
Assessment Monitoring (List 1) Contaminants		
EPA Method 527 (SPE/GC/MS)	Determination of Selected Pesticides and Flame Retardants in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/ Mass Spectrometry (GC/MS). Available at: http://www.epa.gov/safewater/methods/sourcalt.html	5 flame retardants, plus 2 other priority contaminants
EPA Method 529 (SPE/GC/MS)	Determination of Explosives and Related Compounds in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/ Mass Spectrometry (GC/MS). Available at: http://www.epa.gov/nerlcwww/ordmeth.htm	3 explosives
Screening Survey (List 2) Contaminants		
EPA Method 521 (SPE/GC/CI/ MS/MS)	Determination of Nitrosamines in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography with Large Volume Injection and Chemical Ionization Tandem Mass Spectrometry (MS/MS). Available at: http://www.epa.gov/nerlcwww/ordmeth.htm	6 nitrosamines
EPA Method 535 (SPE/LC/MS/MS)	Measurement of Chloroacetanilide and Other Acetamide Herbicide Degradates in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). Available at: http://www.epa.gov/nerlcwww/ordmeth.htm	6 acetanilide herbicide Degradates
EPA Method 525.2 (SPE/GC/MS)	Determination of Organic Compounds in Drinking Water by Liquid-Solid Extraction and Capillary Column Gas Chromatography/ Mass Spectrometry. Available at: http://www.NEMI.gov	3 acetanilide parent herbicides

5.5 Data Deliverables and Other Contract Issues

Laboratory contracts typically include details on data delivery and sample re-analysis cost issues. These issues are discussed in detail below.

5.5.1 Reporting and Reviewing Deadlines

UCMR 2 specifies that the laboratory will need to post the PWS's analytical results, along with the required data elements (see Exhibit 6-3), to SDWARS within 120 days from the sample collection date. Within 60 days of the laboratory(ies) posting these data, the PWS is to review and, if appropriate, approve these results. Once approved and submitted by the PWS, the State and EPA can concurrently review these data via SDWARS. The contract should specify what information the laboratory(ies) will be responsible for reporting. Exhibit 6-2 and 6-3 list the 15 UCMR 2 data elements reported to SDWARS and which entity (the PWS or the laboratory, respectively) has the responsibility to post the information.

Your contract should clearly state the data turnaround requirements to both receive a copy of the analytical results from your laboratory and to have the laboratory post the data to SDWARS. This turnaround time (120 days from sample collection) should be expressed in calendar days (not working days).

Your contract should specify laboratory reporting of not only field sample results but all required QA/QC data. In addition, you may want to include language in your contract that requires the laboratory to notify you when they have posted the data to SDWARS. Note that if you do not specifically request that one (or more) of your samples be used as the LFSM/LFSMD, the laboratory may not report the results of the LFSM and LFSMD, as those results may not pertain directly to your samples; however, you are free to request this information, nonetheless, from your contracted laboratory(ies).

5.5.2 Re-Analysis Costs

It is not uncommon for a laboratory to periodically produce data that are associated with unacceptable QC data or are invalid for other reasons. It is customary that the contract would stipulate that the laboratory will re-analyze samples at no cost to your PWS if the problems are due to laboratory error. If the problems are due to a PWS error and are outside of the laboratory's control (e.g., sample collection errors or improper packaging of samples for shipment to the laboratory), the laboratory would typically not be liable for the additional costs that may result.

5.5.3 Developing a Bid Sheet

After all project requirements are established, it is suggested that you develop a bid sheet to accompany the analytical requirements during the solicitation. The bid sheet allows laboratories to submit bids in the same format, making bid evaluations easier, and also helps to clarify the project. Development and use of a bid sheet is recommended regardless of whether you solicit

the project competitively to multiple laboratories, or are simply requesting a quote from your trusted and regularly used preferred laboratory. The bid sheet provides a very clear vehicle for submitting and evaluating the proposed costs.

The bid sheet typically includes the following information:

- Project identifier (e.g., "UCMR 2 Analytical Services Bid Sheet for *[PWS name and/or facility name]*")
- Laboratory identification information (for when they submit their bid)
- PWS contact information
- Lab deadline for bid submission
- Estimated award date
- Bid validity period (period of time during which the lab's bid is considered valid)
- Laboratory period of performance - This is how long you expect the laboratory to be under contract with the PWS. It should begin from the date you award the bid until 6 months after your last scheduled monitoring (to allow time for the laboratory to resolve possible issues associated with recollection of any samples).
- Data turnaround time – This is the time from sample collection to reporting results (includes the time when the results will be posted to SDWARS, and the laboratory will send you the final analytical report).
- Summary of the analytical requirements
- Analytical Method (e.g., EPA Method 521)
- Number of field samples you anticipate over the course of your 12-month monitoring period (based on the following information):
    - Nature of your source water - Over the 12-month monitoring period, PWSs must monitor twice for groundwater sampling locations; and quarterly at surface water and GUDI sampling locations.
    - Number of EPTDSs at your system
    - Number of DSMRT sampling locations

      Note: DSMRT sampling only applies if you are required to conduct Screening Survey (List 2) monitoring and your system is subject to sampling required by the Stage 1 Disinfectants and Disinfections Byproducts Rule under 40 CFR 141.132(b)(1).
- Available space for laboratories to enter:
    - Per-analysis and total costs to meet these requirements
    - Total estimated cost, signature of laboratory personnel completing bid form, and the date.

Exhibit 5-4 shows an example sample bid sheet. If the PWS is not required to conduct Screening

Survey (List 2) monitoring, that section of the example bid sheet would not apply.

5.6 Evaluating Bids

After the laboratories have received the solicitation and submitted their bids, the PWS would evaluate the bids to identify the laboratory that will be awarded the analytical services contract.

5.6.1 Identifying Responsive Bidders

PWSs may wish to consult their legal department or purchasing department to identify any applicable requirements for evaluating competitive bids. Review submitted bids for accuracy. In addition, it is appropriate to verify that there are no unacceptable contingencies associated with any of the bids.

5.6.2 References

If the PWS has not worked with a particular laboratory before and would like to verify that the laboratory will meet their needs throughout the monitoring period, it is appropriate to ask the laboratory to provide contacts and phone numbers of utility or government clients for whom the laboratory has performed services.

Typical questions of references include:

- Did the laboratory provide data by the required due date?
- Were the data provided by the laboratory of acceptable quality, compliant with contract requirements and in an easy to understand format?
- Were laboratory personnel easy to work with when problems arose during all phases of the project, including sample scheduling, sample analysis, and data review? If problems were noted during data review, was the laboratory prompt and responsive in addressing your concerns?
- Do you have any reservations in recommending this laboratory?

5.7 Communicating with the Laboratory

Maintaining communications with the laboratory is critical to identifying and resolving problems quickly and minimizing the need for recollection and reshipments. At a minimum, it is suggested that your notify the laboratory a few weeks prior to sampling to ensure sampling kits are being prepared and sent to your PWS. Then, following collection, it is suggested that you contact the laboratory to verify that they know to expect samples. Lastly, PWSs are advised to confirm that samples arrived on time at the laboratory and in acceptable condition.

☞ Remember

- The laboratory(ies) that analyze your UCMR 2 samples must be approved by EPA.
- EPA laboratory approval is method-specific.
- The PWS should ensure the laboratory(ies) is (are) approved for each of the methods that they will be tasked to perform.

Exhibit 5-4: Example UCMR 2 Analytical Services Bid Sheet

Shaded areas represent PWS-required fields

Section I. Contact Information

Laboratory name:		PWS name:	
Laboratory address:		PWS Address:	
Laboratory contact:		PWS contact:	
Phone/fax/e-mail:		Phone/fax/e-mail:	

Section II. Schedules

Bid deadline:	Laboratory period of performance:
Estimated award date:	Data turnaround time:
Bid validity period:	

Section III. Assessment Monitoring (List 1) Analytical Services

A. Costs for Assessment Monitoring at Groundwater Locations

Analytical Method	**EPA Method 527.0**	**EPA Method 529.0**
# of Sample Events	**2**	**2**
# of Sampling Locations		
Total # of Samples		
Cost per Sample		
Total Cost		

B. Costs for Assessment Monitoring at Surface Water/GUDI Locations

Analytical Method	**EPA Method 527.0**	**EPA Method 529.0**
# of Sample Events	**4**	**4**
# of Sampling Locations		
Total # of Samples		
Cost per Sample		
Total Cost		

Section IV. Screening Survey (List 2) Analytical Services

A. Costs for Screening Survey at Groundwater Locations

Analytical Method	**EPA Method 521.0 (see NOTE)**	**EPA Method 525.2**	**EPA Method 535.0**
# of Sample Events	**2**	**2**	**2**
# of Sampling Locations			
Total # of Samples			
Cost per Sample			
Total Cost			

B. Costs for Screening Survey at Surface Water/GUDI Locations

Analytical Method	**EPA Method 521.0 (see NOTE)**	**EPA Method 525.2**	**EPA Method 535.0**
# of Sample Events	**4**	**4**	4
# of Sampling Locations			
Total # of Samples			
Cost per Sample			
Total Cost			

Section V. Total Costs

Total Quoted Cost	Signature Lab Contact	Date

NOTE: PWSs required to conduct Screening Survey (List 2) must collect from both EPTDS and DSMRT locations for Method 521.0. The # of sampling locations for Method 521.0 must reflect these DSMRT locations.

CHAPTER 6. REPORTING REQUIREMENTS

6.1 How and Where to Report UCMR 2 Information

UCMR 2 specifies that PWSs must fulfill most of their reporting requirements using EPA's electronic data reporting system for UCMR 2. The CDX is the Web enabled portal used to gain access to the electronic reporting system known as SDWARS. PWS reporting requirements via SDWARS include:

- supplying contact information, and any needed updates;
- providing the inventory of sample location information, or expanding, updating, and correcting the available inventory, as needed;
- requesting monitoring schedule changes (within 210 days of the publication of the final Rule [i.e., by August 2, 2007]); and,
- submitting your approved monitoring results along with associated data elements.

SDWARS provides screen-specific instructions to help you report the needed information, and to navigate through the reporting system.

As part of the early UCMR 2 implementation efforts, PWSs received correspondence in 2006 related to establishing a CDX account for SDWARS to support UCMR 2 reporting. If a PWS does not have access to SDWARS, they may not be able to meet their reporting requirements. If you have not established a CDX account for SDWARS, please send a request to the UCMR Sampling Coordinator, as indicated in Section 7.4.

6.2 Information to Be Reported Prior to Monitoring

To facilitate rule implementation, UCMR 2 specifies that PWSs must provide the following prior to monitoring.

6.2.1 Contact and Inventory Information

Keeping PWS contact and inventory information current within the electronic reporting system will enable EPA to effectively communicate with the PWSs, and accurately track and analyze UCMR 2 monitoring data. This is critical in order to resolve questions of compliance.

6.2.1.1 What Contact Information Must PWSs Report?

PWSs must report a Technical and an Official Contact. The **Technical Contact** is the person responsible for the technical aspects of UCMR 2 activities at the PWS, such as details concerning sampling and reporting. The **Official Contact** is the person who functions as the official spokesperson for the water system regarding all UCMR 2 activities. The UCMR 2

requires reporting the following information to SDWARS for these contacts:

- Name;
- Organization;
- Mailing address;
- Phone number; and
- E-mail address.

6.2.1.2 When and Where Must the PWS Report the Contact Information?

Report this information to SDWARS within 90 days of the publication of UCMR 2 (i.e., by April 4, 2007). If any contact information changes, the PWS is required to make the edits via SDWARS within 30 days of the change.

6.2.1.3 What Inventory Information Must the PWS Report to EPA?

To ensure that monitoring results are associated with the correct sample location at the PWS, UCMR 2 requires reporting the following inventory information for each of the sample location:

- Public water system identification (PWSID)
- PWS name;
- PWS facility identification;
- PWS facility name
- Facility water source type
- Sample point identification;
- Sample point name; and
- Sample point type

UCMR 2 requires PWSs subject to the Screening Survey (List 2) to collect an additional sample for nitrosamines (EPA Method 521.0) at their distribution system maximum residence time (DSMRT) location(s) for each treatment plant/water source where disinfection is applied, as defined in the Stage 1 DBPR (see section 4.2). The PWSs subject to the Screening Survey (List 2) must provide and/or review the information within their SDWARS inventory to ensure that the proper EPTDS location for each treatment plant/water is associated with the respective DSMRT location.

6.2.1.4 When and Where Must the PWS Report Inventory Information?

To help minimize the reporting burden, EPA is pre-populating large system sample location inventory with recent large system inventory information provided by many States, with information from SDWARS, version 1.0 (used during UCMR 1), and with supplemental

information from the Safe Drinking Water Information System (SDWIS). While much of the sample location inventory information for many PWSs will be complete, in some cases it may not be accurate. The PWS is responsible for verifying, correcting, and updating any inventory information that is already in SDWARS, and is responsible for adding new facilities and sample points, or other missing information, as appropriate. This process must be completed within 210 days of the publication of the final UCMR 2 (i.e., August 2, 2007).

6.2.2 Representative Groundwater Entry Point Monitoring

6.2.2.1 Can a PWS Request to Monitor at Representative Groundwater EPTDSs?

If a PWS uses groundwater as a source, and has multiple EPTDSs, it may qualify to conduct representative groundwater entry point monitoring rather than monitoring at each EPTDS. If the PWS already has an EPA- or State-approved alternate EPTDS sampling location(s) from either UCMR 1 or Phase II/V compliance monitoring, it may submit a copy of this alternate sampling plan documentation to EPA.

If a PWS does not already have an approved alternative sampling plan for groundwater locations, it may submit a proposal to sample at representative groundwater EPTDS(s) rather than at each individual EPTDS if:

- ➢ Groundwater is used as the source at all the locations being represented;
- ➢ All of the applicable well sources have either the same treatment or no treatment; and
- ➢ There are separate EPTDSs for each well within the well field (resulting in multiple EPTDSs from the same source, such as an aquifer).

UCMR 2 specifies that either a previously-approved alternate sampling plan, or a representative groundwater monitoring plan can be submitted to the UCMR Sampling Coordinator within 120 days of the publication of the UCMR 2 (i.e., by May 4, 2007) so that reviews and approvals can take place in time for scheduled monitoring.

The PWS must receive written approval from EPA or their State before limiting sampling to representative entry points.

If a PWS is interested in preparing a groundwater representative monitoring plan, or has other questions about representative sampling under UCMR 2, it should contact the UCMR Sampling Coordinator directly by mail, e-mail, or fax (see Section 7.4).

6.2.3 Notifications Regarding System Applicability

In some cases, the PWS's operation may change over time such that a system's status and requirements under UCMR 2 are affected. Because of this, UCMR 2 is requiring PWSs to notify EPA when situations related to their applicability and monitoring status change. EPA must be made aware of situations in which systems: have not been contacted regarding the rule requirements; may have been incorrectly notified as being subject to the rule; or have a change in

status that could impact their monitoring and reporting requirements.

6.2.3.1 What If a PWS Has Not Been Contacted About UCMR 2 Requirements?

All CWSs and NTNCWSs that serve a total population of more than 10,000 people and do not purchase **all** of their finished water are required to conduct UCMR 2 monitoring. If a water system meets these applicability requirements and has not been contacted by either EPA or their State regarding UCMR 2 within 150 days of the publication of the final UCMR 2 (i.e., by June 4, 2007), the PWS must contact the UCMR Coordinator by fax, mail, or e-mail (see Section 7.4). This correspondence should explain why the PWS believes it is subject to the UCMR requirements. EPA will then notify the PWS regarding applicability status and sampling schedule. Note that if the PWS meets UCMR 2 applicability requirements, it is subject to the UCMR 2 requirements regardless of whether it has been notified by the State or EPA.

6.2.3.2 What If a PWS Does Not Meet Applicability Requirements or Has a Change in Status?

If a PWS receives a notice from EPA or the State regarding required UCMR 2 monitoring, but believes it is not subject to UCMR 2, the PWS should fax, mail, or e-mail a letter to the UCMR Sampling Coordinator (see Section 7.4). The letter should include an explanation as to why the UCMR requirements are not applicable.

- ➢ Reasons that a PWS may not meet the UCMR applicability criteria include the following: a system purchases all finished water from another water system; a system is a transient non-community water system; or, a system has been incorrectly classified as a large system.

However, the PWS is considered subject to the UCMR 2 requirements specified in the original notification unless it receives a letter from EPA agreeing that the PWS does not meet the applicability requirements, or specifies adjusted requirements.

6.3 Information to Be Reported with Monitoring Results

UCMR 2 specifies 15 data elements be reported with analytical results (though data element 6, "Disinfectant Residual Type," applies only to systems conducting Screening Survey Monitoring). The data elements will provide information about the water system, the sample, and the laboratory analysis that allow EPA to accurately track and analyze monitoring data.

Exhibit 6-2 and 6-3 describe each data element. PWSs report data elements 1 – 6, shown in Exhibit 6-2, to SDWARS prior to monitoring as well as with every sample result. Laboratories post data elements 1, 2 and 4 as well as data elements 7 – 15, shown in Exhibit 6-3, to SDWARS with each set of sampling results. PWSs must ensure that their laboratory reports these data elements, and the UCMR 2 sample results to SDWARS, within 120 days of the sample collection date.

Exhibit 6-1: Key Reporting Dates Prior to Monitoring

Reporting Requirement:	***Due Date:***
Information to Be Reported to SDWARS	
Contact information[1]	April 4, 2007
Sampling location/inventory information[1]	August 2, 2007
Changes to sampling schedule	August 2, 2007[2]
Information to Be Reported to UCMR Sampling Coordinator	
UCMR 2 applicability questions or change in PWS status	As soon as possible
Groundwater Representative EPTDS proposal *(optional)*	August 2, 2007
Notify EPA if not contacted regarding UCMR 2 monitoring requirements	As soon as possible, but no later than June 4, 2007

[1] Revisions must be reported within 30 days of the changes to SDWARS.

[2] After this date, must notify UCMR Sampling Coordinator to change sampling schedule.

Data Elements

Exhibit 6-2: SDWARS Data Elements Reviewed/Reported by PWS
1. PWSID is used to identify each PWS. It typically begins with the standard 2-character postal State abbreviation or Region code; the remaining 7 numbers are unique to each PWS in the State. The same PWSID must be used to identify the PWS for all current and future UCMR monitoring.
2. PWS Facility ID is a 5-digit number, unique to each of the PWS's applicable facilities. These designate treatment plant(s), distribution system(s), or any other facility associated with water treatment or delivery at the PWS. The same code must be used to represent the facility identification for all current and future UCMR monitoring. The code is established by the State or at the State's discretion, by the PWS.
3. Water Source Type is the type of source water at the facility. For each facility, report one of the following: **SW** = If any surface water source is used, or partially used, during the entire 12-month monitoring period **GW** = If a groundwater source is **exclusively** used during the entire 12-month monitoring period **GU** = If any groundwater under the direct influence of surface water source is used, or partially used, during the 12-month monitoring period (however, if at any point during the 12-month monitoring period any surface water source is used, or partially used, the source water type for the facility should be reported as SW not GU).
4. Sample Point ID is established by the State, or at the State's discretion, by the PWS that uniquely identifies each sample point. This code must be unique within each applicable facility, for each applicable sample location. The same identification code must be used to represent the sample location for all current and future UCMR monitoring.
5. Sample Point Type clarifies the type of location at the sample point. For each sampling point, report either: **EP** = entry point to the distribution system. **MR** = distribution system's maximum residence time (i.e., DSMRT).
6. Disinfectant Residual Type is the type of disinfectant in use at the time of UCMR 2 sampling to maintain a residual in the distribution system. This must be reported for each *Screening Survey (List 2) sample point (EPTDS and DSMRT).* The PWS must report one of the following: **CL** = chlorine **CA** = chloramine **OT** = all other types of disinfectant (e.g., chlorine dioxide) **ND** = no disinfectant used

Data Elements

Exhibit 6-3: SDWARS Data Elements Posted by Laboratories with Sample Results

In addition to PWSID, PWS Facility ID, and Sampling Point ID, laboratories must report with analytical results the following...

7. Sample Collection Date is the date the sample is collected.

8. Sample ID is an alphanumeric value assigned by the lab to uniquely identify samples.

9. Contaminant is the UCMR 2 contaminant for which the sample is being analyzed.

10. Analytical Method is used to identify the analytical method used.

11. Sample Analysis Type is the type of sample collected and/or prepared, as well as the fortification level. Labs will designate one of these four codes for each sample:
FS = field sample; sample collected and submitted for analysis under this rule.
LFSM = laboratory fortified sample matrix; a UCMR field sample with a known amount of the contaminant(s) of interest added.
LFSMD = laboratory fortified sample matrix duplicate; duplicate of the laboratory fortified sample matrix.
CF = concentration fortified; reported with sample analysis types LFSM and LFSMD, the concentration of a known contaminant added to a field sample.

12. Analytical Result – Sign is a value indicating whether the analytical result was:
(<) less than the MRL.
(=) equal to the level reported in "Analytical Result - Value."

13. Analytical Result – Value is the actual value of the measured analytical result for FSs, LFSMs, and LFSMDs or the value of CF.

14. Laboratory ID is assigned by EPA to identify each lab. It begins with the standard two-character State postal abbreviation; the remaining five numbers are unique to each laboratory in the State.

15. Sample Event indicates the period in which the samples were collected. This will associate samples with the PWS monitoring plan to allow EPA to track compliance and completeness.

Use:
SE1 = for samples collected during the 1st sampling period (all source types).
SE2 = for samples collected during the 2nd sampling period (all source types).
SE3 = for samples collected during the 3rd sampling period (SW and GUDI sources only).
SE4 = for samples collected during the 4th sampling period (SW and GUDI sources only).

NOTE: *If you are required to replace a sample, its replacement must have the same SE code as the sample it replaces.*

6.3.1 What If More Than One Set of Results is Reported?

If more than one set of valid results are reported to SDWARS for the same sample location and the same sample event, EPA will use the highest of the reported values as your official results.

6.3.2 Can a PWS Submit Previously Collected Monitoring Data?

No! Previously collected data can not be grandfathered to meet UCMR 2 monitoring requirements. UCMR 2 specifies that no pre-existing monitoring results will be accepted to meet the testing and reporting requirements of UCMR 2. EPA wants to ensure that all samples have been analyzed using the approved methods by EPA-approved laboratories, as specified in UCMR 2.

6.4 Electronic Reporting and Data Review

UCMR 2 provides a specific and stringent timeline for laboratories to post UCMR data into EPA's electronic data reporting system. In addition, PWSs will be held to a specific timeline for review and approval of the posted data.

6.4.1 What Role Does the EPA-Approved Laboratory Play in Reporting Data?

To participate in UCMR 2, EPA-approved laboratories have agreed that all analytical results and required data elements will be reported through EPA's electronic reporting system. This was specified as part of UCMR 2 to facilitate "single-entry" of data; reducing reporting errors and the time involved in investigating, checking, and correcting errors at all levels (laboratory, PWS, State, and EPA). The laboratory must post results to the electronic reporting system (i.e., SDWARS) within 120 days from the date of sample collection.

6.4.2 What Role Does the PWS Play in Reporting the UCMR 2 Data?

The PWS is responsible for ensuring that the laboratory conducting the analyses posts the results within the required time frame. The PWSs then has 60 days, after the laboratory posts the results into SDWARS, to act upon the data. PWS-approved results are concurrently reviewed by the State and EPA via the electronic reporting system.

If the PWS does not act upon the data within 60 days after it is posted by the laboratory, it will be considered approved and available to EPA and the State for review prior to public release. Data will be placed into NCOD (EPA's national drinking water contaminant occurrence database), and made available to the public after EPA has reviewed the data. NCOD stores data regarding both regulated and unregulated contaminants found in public water systems, and can be accessed through: http://www.epa.gov/safewater/data/ncod/index.html.

Exhibit 6-4: Key Reporting Dates Following Monitoring

Requirement:	Due Date:
Laboratory posts monitoring results and associated data elements	120 days from sample collection
PWSs approve and submit monitoring data	60 days from lab posting of data*

**After this date, EPA will consider the data approved by the PWS, and available for EPA and State review, prior to public release. The data will be placed in NCOD during its next update.*

6.5 Consumer Confidence Report and Public Notification Rules

Reporting UCMR information to the public is addressed in the Safe Drinking Water Act's (SDWA's) right-to-know provisions. The SDWA [§1445 (a)(2)(E)] requires all water systems that monitor for unregulated contaminants to inform the public if any unregulated contaminants have been detected in their drinking water as part of the Consumer Confidence Report (CCR) requirements, and to notify the public that the monitoring results are available as part of Public Notification (PN). These requirements apply to both Assessment Monitoring and Screening Survey monitoring.

6.5.1 What Are the CCR Requirements for UCMR?

The CCR Rule, published on August 19, 1998 (63 FR 44511), requires community water systems (CWSs) to report unregulated contaminant monitoring results whenever they are detected (i.e., are above the minimum detection limit). The CCR Rule does not apply to non-community water systems. A PWS should briefly explain in the CCR why it is monitoring for unregulated contaminants. A suggested explanation follows:

Unregulated contaminants are those that don't yet have a drinking water standard set by USEPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard.

For more information on preparing and meeting CCR requirements, PWS should go to the EPA CCR Web site, at: www.epa.gov/safewater/ccr.

6.5.2 What Are the Public Notification Requirements for UCMR 2?

The Public Notification (PN) Rule was published on May 4, 2000 (65 FR 25981). This regulation applies to both CWSs and NTNCWSs. In addition to requiring notification of violations, the PN Rule requires PWSs to provide special notices for certain situations, including the availability of unregulated contaminated monitoring data (40 CFR 141.207). Special public notices of unregulated contaminated monitoring data are different from other public notices because they do not have to contain all the elements required of other types of public notices. Instead, systems need only report that the results are available, and provide a phone number or contact where the results can be obtained.

EPA's *Public Notification Handbook* (EPA 816-R-00-010, June 2000) provides useful information for water system operators on how to write and distribute effective public notices. It also contains a sample certification form that systems can submit to their State. The Handbook is available at http://www.epa.gov/safewater/pws/pn/handbook.pdf.

CHAPTER 7. FOR MORE INFORMATION

7.1 UCMR Message Center

UCMR questions of any kind can be left at the UCMR Message Center (800-949-1581), staffed by the EPA UCMR implementation support contractor, Great Lakes Environmental Center (GLEC). Callers should expect to receive a response within 72 business hours.

7.2 Safe Drinking Water Hotline

General questions should be directed to the Safe Drinking Water Hotline at 800-426-4791.

7.3 CDX/SDWARS Help Desk

Questions specifically related to the CDX or the SDWARS electronic reporting system should be directed to the CDX Help Desk at 1-888-890-1995. Or send an e-mail (epacdx@csc.com) with "UCMR Tech Support" in the e-mail subject line. You can also fax assistance requests 24 hours a day to 703-917-7105. Personal phone support is available from 8:00 a.m. to 6:00 p.m. EST/EDT.

7.4 UCMR Sampling Coordinator

Throughout this Reference Guide, there are many references to contacting the USEPA regarding UCMR 2 implementation issues. Send official correspondence as follows:

Send communications to:

Mail: UCMR Sampling Coordinator,
USEPA, Technical Support Center,
26 West Martin Luther King Drive (MS 140)
Cincinnati, OH 45268

E-mail: UCMR_Sampling_Coordinator@epa.gov

Fax: (513) 569-7191

7.5 UCMR Laboratory Approval Coordinator

Information about the EPA UCMR 2 Laboratory Approval Program can be obtained by contacting the "UCMR Laboratory Approval Coordinator" at the mailing address indicated in section 7.4.