ABSTRACT

OUTREACH COORDINATOR FOR THE UNREGULATED CONTAMINANT MONITORING REGULATION: AN INTERNSHIP WITH THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By Cory James Wagner

This document summarizes the author’s internship experience working on the Unregulated Contaminant Monitoring Regulation (UCMR) for the United States Environmental Protection Agency. The Unregulated Contaminant Monitoring Regulation was designed, as part of the Safe Drinking Water Act, to collect occurrence data of unregulated contaminants of interest in drinking water. All information collected will be used to support the creation of new drinking water regulations. The author’s internship with EPA focused on the public outreach side of the Unregulated Contaminant Monitoring Regulation. The author edited the quarterly newsletter The UCMR Update, which provided information to stakeholders concerning events within the UCMR. The author also served as the coordinator for the large system Aeromonas data and as a tester for the Safe Drinking Water Accession and Review Database (SDWARS) that was used to store UCMR information. Finally, the author also performed laboratory validation work for Standard Method 5910B and proposed EPA Method 415.3.
OUTREACH COORDINATOR FOR THE UNREGULATED CONTAMINANT MONITORING REGULATION: AN INTERNSHIP WITH THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

An Internship

Submitted to the
Faculty of Miami University
In partial fulfillment of
The requirements for the degree of
Master of Environmental Science
Institute of Environmental Sciences

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2003

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LIST OF ACRONYMS

AWBERC- Andrew W. Breidenbach Environmental Research Center
CCL- Contaminant Candidate List
DBP- Disinfection Byproduct
DOC- Dissolved Organic Carbon
DOE- Department of Energy
DWPD- Drinking Water Protection Division
EPA- U.S. Environmental Protection Agency
GMF- Glass Microfiber
ICR- Information Collection Rule
IES- Institute of Environmental Sciences
KHP- Potassium Hydrogen Pthalate
LD- Lowest Disinfectant Residual in the Distribution System
LRW- Laboratory Reagent Grade Water
M. En- Masters Degree in Environmental Science
MCL- Maximum Contaminant Level
MCLG- Maximum Contaminant Level Goal
MD- Midpoint in the Distribution System
MR- Maximum Residence Time in the Distribution System
MRS- Monitoring Review Sheet
NCOD- National Contaminant Occurrence Database
ORISE- Oak Ridge Institute for Science and Education
OGWDW- Office of Ground Water and Drinking Water
PES- Polytether Sulfone
PSP- Public Service Project
PTFE- Polytetrafluorethylene
PVDF- Polyvinylidiene Fluoride
PWS- Public Water System
SDWA- Safe Drinking Water Act
SDWARS- Safe Drinking Water Accession and Review Database
SMP- State Monitoring Plan
SRMD- Standards and Risk Management Division
TOC- Total Organic Carbon
TSC-Technical Support Center
UCMR- Unregulated Contaminant Monitoring Regulation
UV-254- Ultraviolet Absorption at 254 nm
ACKNOWLEDGMENTS

The Author would like to thank his committee members, Dr. James Oris, and Dr. Adolph Greenberg for their input into this project. He would also like to thank his advisor, Dr. Gene Willeke, for the guidance and support given in this internship.

Furthermore, the author would like to thank R. Kent Sorrell, his mentor in this internship, for showing him the ropes of the EPA and always looking out for him. Also, I would like to thank him for imbuing everything with a sense of humor.

The author wishes to thank the entire UCMR team, including Dan Hautman, Chris Frebis, R. Kent Sorrell, Pat Fair, Michella Karapondo, Michael Cummins, and Bonnie Newport for being so supportive and allowing him to experience a lot during his year here. Thanks to Eric “Little Buffalo” Bissonette for serving as the ORISE coordinator at EPA and only firing him or two times a week. The G7 intern crew also deserves a hearty thank you for making lunch interesting and fun.

The author wishes to thank his parents, Janet Antal and Larry Wagner, for providing him with the skills he needed to get this far in his educational development. His dad gave him his analytical side and his biting wit. He also gave him his tendency to forget things easily. His mom gave him his warm, compassionate side, which helps him in dealing with other people in a good manner as well as his ability to converse well.
CHAPTER 1
INTRODUCTION

Overview of the M. En Degree Program

The Institute of Environmental Sciences (IES) at Miami University offers a Masters Degree in Environmental Science (M.En). The program stresses an interdisciplinary approach to address complex environmental problems. This approach draws on the collected knowledge of all branches of academic study, including science, history, the arts, education, and philosophy, to name a few. The program has established several requirements for attaining the M. En Degree. Among these requirements are the following (IES, 2001):

- A minimum of 22 hours in the IES core courses, a minimum of 14 hours in specialty electives, and six hours of research credit must be taken.
- A course in ecology at the undergraduate level, to be completed prior to or during the M. En. program.
- Participation in a Public Service Project (PSP) team and submission of a final written report.
- The passing of a comprehensive examination.
- Acceptance of a proposal for the practicum/internship/thesis work.
- Submission of monthly progress reports on practicum and internships.
- Completion and oral defense of a practicum/internship/thesis and deposition of a final comprehensive report.

This document fulfills the final requirement of the IES program. It recounts the author’s year-long internship with the United States Environmental Protection Agency (EPA), in the Office of Ground Water and Drinking Water’s (OGWDW) Technical Support Center (TSC) from July of 2002 to June of 2003. This internship was funded by the Oak Ridge Institute for Science and Education (ORISE). The ORISE program was created by the Department of Energy (DOE) and is centered in the Oak Ridge National
Laboratory in Oak Ridge, Tennessee. The ORISE program and the DOE have created an interagency agreement with EPA. This agreement allows for the placement of students, with a bachelor degree or higher, in EPA to conduct original research or participate in the daily activities of the Agency.

Justification of the Internship at EPA

This internship allowed the author to gain invaluable experience working with one of the premier environmental programs in the world. The time spent at EPA allowed the author to use both his undergraduate degree in Biochemistry and the interdisciplinary education that he received while working on the M. En Degree to aid in the implementation of a complex government regulation, the Unregulated Contaminant Monitoring Regulation (UCMR). It also allowed the author to perform a limited amount of laboratory work to aid in EPA method development and refinement. The author’s area of concentration is in Toxicology and Hazardous Substances. The courses taken in Toxicology helped him to better understand the health effects, routes of exposure, and risk assessments of the contaminants that were being investigated under the UCMR. The knowledge he gained in the Environmental Policy class allowed him to have a better understanding of how the U.S. government and EPA frame policy. The course in Environmental Law made him very prepared in dealing with the background laws and regulations that frame the UCMR. Furthermore, the experience he gained working with an interdisciplinary team through the Public Service Project helped him immensely as the UCMR team is composed of chemists, engineers, statisticians, and environmental scientists.

This internship allowed the author to participate in nearly all aspects of rule implementation. The author gained experience in working with the drinking water utilities and laboratories through the follow-up that he performed for *Aeromonas* data. He gained experience in writing for various audiences through the authorship and review of several EPA documents including the *UCMR Update*. He also gained some laboratory experience through his participation in the validation of Standard Method 5910 and through conducting a performance evaluation of proposed EPA Method 415.3. The author also learned valuable database skills through the creation of a tracking database.
for the large system *Aeromonas* data. In short, the author gained a lot of technical skill and policy knowledge of the workings of EPA during his internship.

**Scope of the Final Report**

This report will start with an overview of the history, purpose, goals, and organization of EPA, the Office of Water, the Office of Ground Water and Drinking Water, and the Technical Support Center. A discussion of the implementation of the Unregulated Contaminant Monitoring Regulation will be provided in order to understand the context within which this internship was conducted.

The final portion of this report will detail the author’s role and responsibilities during his internship with TSC, including his position on the UCMR team and his work in method validation. It will include his work as the editor of the *UCMR Update*, as the coordinator for the large system *Aeromonas* data, as a tester for the Safe Drinking Water Accession and Review (SDWARS) database, and as a validator for Standard Method 5910 and proposed EPA Method 415.3. The report will conclude with a discussion about what was learned during this internship, the IES program, EPA, and the future goals of the author.
CHAPTER 2
ORGANIZATION OF THE INTERNSHIP POSITION

The Formation of United States Environmental Protection Agency

Prior to 1960, little thought was given to the environment in the United States. There were very few regulations as to what could or could not go into the air, water, and land. Then, in 1962, Rachel Carson published *Silent Spring*, a book warning about the effects the pesticide DDT was having on bird populations. This book sparked a new environmental consciousness and led to public pressure on the government to provide clean air, water, and a healthy environment (EPA, 2003a). Congress responded to this increasing pressure with the National Environmental Policy Act of 1969. This act consisted of three key elements (Sullivan, 1999):

- A declaration of national environmental polices and goals.
- Provisions that required federal agencies to uphold the stated policies and goals, including the consideration of the impact to the environment of any federal project and the preparation of an impact statement.
- The creation of a Council of Environmental Quality (CEQ) in the Executive Office of the President.

It quickly dawned upon then-President Nixon that the way the government was currently organized, with various departments within the cabinet handling various environmental issues, would neither be entirely efficient or unbiased. Thus, on December 2, 1970, the United States Environmental Protection Agency was created as an independent agency charged with the safeguarding and improvement of the environment. The other previously established departments and offices relinquished their authority over issues concerning the environment to the newly created agency (EPA, 2003a).
Thirty-three years later, EPA is one of the premier environmental agencies in the world. EPA’s mission is to guarantee that:

- Everyone is protected against significant risks to human health and the environment wherever they are.

- All efforts to reduce environmental risk are based on the best available scientific information.

- Federal laws concerning human health and the environment are enforced fairly and effectively.

- Protection of the environment is considered in all U.S. policies.

- All people have access to information that allows them to participate in managing human health and environmental risks.

- Environmental protection contributes to the diversity, sustainability, and productivity of all communities.

- The United States serves as a leader in the protection of the global environment (EPA, 2003b).

Thus, the goals and objectives of the organization are to protect the quality of the environment in the United States in order to preserve public and ecological health.

Today, EPA oversees numerous comprehensive laws aimed at protecting the environment. These include the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Oil Pollution Act, the Safe Drinking Water Act (SDWA), the Comprehensive Environmental Response, Compensation and Liability Act, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act. EPA interacts with state, territorial, tribal and local agencies in the implementation and the enforcement of these laws. A state, territory, or tribe may take primacy in upholding the federal laws or introduce their own laws provided they are at least as stringent as the concurrent federal law. EPA also works closely with the public in the development of new standards and regulations. It strives to be an agency that does not dictate requirements in a “top-down” fashion, but rather involves the public from the beginning in submitting requests for comment during all phases of regulation development.
EPA consists of approximately 18,000 scientists, administrators, and support staff. These personnel are located in the headquarters office in Washington D.C., the 10 regional offices across the United States, and 17 laboratory facilities. The Technical Support Center is housed in one of the laboratory facilities, the Andrew W. Breidenbach Environmental Research Center (AWBERC) in Cincinnati, Ohio.

**Organization of EPA**

The Environmental Protection Agency is directed by an Administrator and a Deputy Administrator, both of whom are appointed by the President of the United States and confirmed by the Senate. The current EPA Administrator is Governor Mike Leavitt. The President also appoints nine assistant administrators, one each for the following Offices (Figure 1): the Office of Administration and Resource Management; the Office of Air and Radiation; The Office of Enforcement and Compliance Assurance; the Office of International Activities; the Office of Policy, Planning, and Evaluation; the Office of Prevention, Pesticides, and Toxic Substances; the Office of Research and Development; the Office of Solid Waste and Emergency Response; and the Office of Water. In addition, the President appoints the Inspector General and the General Counsel of the Agency.
There are also 10 regional field offices that are spread throughout the country and encompass the fifty states and the U.S. territories. These regional offices are assigned to a defined group of states, tribes and territories, which they assist with compliance and adherence to federal environmental regulations.

**The Office of Water**

The Office of Water is responsible for protecting the nation’s water resources, which include all surface waters, such as lakes and rivers, ground water, and the portion of the oceans that are within in territorial control of the United States. The Office seeks to protect these water resources for use as drinking water, recreation, and as ecological habitats. The Office of Water is primarily charged with implementing and upholding the Clean Water Act and Safe Drinking Water Act. The Office also has a role in implementing numerous other environmental laws.
The Office of Water is composed of four Offices (Figure 2): the Office of Ground Water and Drinking Water; the Office of Science and Technology; the Office of Wastewater Management; and the Office of Wetlands, Watersheds, and Oceans.

Figure 2: Organization of the Office of Water (EPA, 2003d)

**The Office of Ground Water and Drinking Water**

The Office of Ground Water and Drinking Water is charged with protecting the ground and drinking water of the United States. The Office performs this duty through the implementation of the Safe Drinking Water Act. The OGWDW is also responsible for developing and setting National Primary and Secondary Drinking Water Standards. The primary drinking water standards are established for contaminants that adversely affect human health. Secondary drinking water standards concern aesthetic issues such as the color and odor of water. OGWDW also helps to fund both state and local drinking water and source protection programs. In addition, it provides economic assistance to small public water systems (PWSs) to meet the regulation requirements set out by EPA. Finally, it oversees the Underground Ground Injection Control Program, which regulates underground injections in order to protect ground water (EPA 2003e).
OGWWD is divided into two divisions (Figure 3): The Standards and Risk Management Division (SRMD) and the Drinking Water Protection Division (DWPD). Each of these divisions is further sub-divided into three branches (Figure 3). The DWPD is divided into the Protection Branch, the Prevention Branch, and the Infrastructure Branch. The SRMD is divided into the Target Analysis Branch, the Standards and Risk Reduction Branch and the Technical Support Center (TSC).

![Figure 3: Organization of the Office of Ground Water and Drinking Water (EPA, 2003f)](image)

**The Technical Support Center**

While all the other branches of the ODWGW are located in Washington D.C., the Technical Support Center is located in Cincinnati, Ohio in the AWBERC Laboratory. TSC is responsible for several programs within the ODWGW. These include the following (EPA 2003f):
• Providing technical and scientific support to the development and implementation of drinking water regulations.

• Managing the Unregulated Contaminant Monitoring Regulation (UCMR) implementation and drinking water laboratory certification program.

• Supporting the Partnership for Safe Water, treatment plant optimization and analytical methods development.

The intern worked primarily as part of the UCMR team (Figure 4). This group was charged with the implementation of the UCMR. The team was headed by Gregory Carroll, the Branch Chief of TSC. He was responsible for reviewing all technical documents that come out of TSC and also had the ultimate authority on decisions concerning the UCMR. The co-team leaders were Dan Hautman and Christopher Frebis. Dan Hautman was responsible for the UCMR budget, the contracts between EPA and the laboratories that supported the UCMR, and also general decision making. Chris Frebis was responsible for most of the compliance tracking in the UCMR as well as interfacing with the contractor assigned to SDWARS. Michael Cummins and Michella Karapondo were responsible for the data systems side of the UCMR program. They created and managed many of the data systems used by EPA in the implementation of UCMR. They also handled the responsibility of ensuring data quality and transferring the data from EPA to the National Contaminant Occurrence Database (NCOD), as required by the UCMR. Mary Ann Feige was responsible for the development of EPA Method 1605 that was used to determine the presence of Aeromonas in drinking water. Jennifer Birkenhauer was in charge of a speciation program to determine which species of Aeromonas was present in detections. David Munch was responsible for the development of the chemistry methods that were used in the UCMR. Pat Fair and R. Kent Sorrell had roles as laboratory data approvers. Kent Sorrell further served as the author’s mentor on this internship. He and Pat Fair worked with the author on the laboratory method validations. Phyllis Branson maintained the UCMR web page and performed other outreach functions. Bonnie Newport coordinated the shipping and receiving of the UCMR sample kits. Finally, the author, Cory Wagner, served the role of outreach coordinator. This included, among other tasks, writing and editing the UCMR Update, and serving as the large PWS Aeromonas coordinator.
Figure 4: Organization of the Unregulated Contaminant Monitoring Regulation Team
CHAPTER 3
THE UNREGULATED CONTAMINANT MONITORING REGULATION

Most of the work performed by the intern during the yearlong appointment at EPA was in reference to the implementation of the Unregulated Contaminant Monitoring Regulation. This chapter will cover the details and background of the UCMR in order to define my role within the project.

Overview

In brief, the UCMR is a nationwide drinking water occurrence survey. The 1996 Amendments to the Safe Drinking Water Act dictates that the EPA will establish a list of possible contaminants to be monitored in drinking water and gather occurrence and health effects information on the compounds and microbes. This will aid in the EPA’s ability to make decisions as to the regulation of a given contaminant in drinking water. It is considered part of EPA’s “sound science” approach in which quality data regarding the presence and health effects of a given compound in drinking water will be gathered prior to any regulatory decision-making. The UCMR fulfills one of these requirements: it collects information on the occurrence of the unregulated contaminants in drinking water. Together with compiled health effects information and cost/benefit analysis, informed decisions can be reached as to what should and should not be in drinking water and at what levels. The UCMR operates on a five-year cycle.

Legislative Background for the Unregulated Contaminant Monitoring Regulation

Congress promulgated the UCMR in the 1986 amendments to the SDWA. This program was to provide the EPA with information on occurrence and health effects of contaminants in drinking water that were not already regulated. The data derived from this study would be used to assist the EPA in determining whether regulations were necessary for a given contaminant in drinking water. The initial UCMR put forth drinking water standards in five-year long phases, with each phase having several regulated contaminants for which there were maximum contaminant levels established in drinking water. The PWSs were required to monitor for the regulated compounds and this was termed compliance monitoring. Each phase also contained several unregulated
contaminants that needed further study before EPA could make a decision on whether or not to regulate (Federal Register, 1999). These unregulated contaminants were often selected based on the fact that the methods used in compliance monitoring could also detect them as well. No new methods were developed for the unregulated contaminants and they were considered somewhat of an add-on. All PWSs with more than 150 service connections were required to monitor for the regulated and unregulated contaminants and then report them to their primacy agency, or the agency that took charge of the monitoring program. The States took primacy over the UCMR program and, since there were multiple primacy agencies with multiple plans, the monitoring of the unregulated contaminants was very inconsistent.

In order to resolve this issue and strengthen the program, the UCMR was revised in the 1996 amendments to the SDWA. Section 1445(a)(2) of the SDWA was amended to require EPA to “establish criteria for a program to monitor unregulated contaminants and to publish, by August 6th, 1999, a list of contaminants to be monitored” (Federal Register, 1999). The 1996 Amendments to the SDWA revised the existing UCMR in several ways. First of all, it attempted to reduce the sampling burden on the small water systems, which were defined to be those systems that served under 10,000 people, by using a statistical approach to select 800 small systems to monitor for the UCMR. In the previous UCMR, all water systems with at least 150 service connections were required to sample, meaning that most of the 65,600 water systems that serve under 10,000 people had to monitor. This new regulation cut that number down to 800 systems and further reduced the cost burden through the fact that EPA agreed to pay most of the sampling costs. Second, it limited the number of unregulated contaminants that could be monitored by a single system to 30. This was done to further decrease the monitoring load on the water systems. Third, it changed the required elements to be reported with the data so as to insure data quality and to further support regulatory decisions. This change included the addition of laboratory quality control data to be reported along with the analytical result. Fourth, it altered the reporting system so that the water systems would be reporting directly to EPA and mandated that the reporting be conducted electronically, via the Internet. EPA then would review the data and submit it to the National Drinking Water Contaminant Occurrence Database. This change granted EPA
primacy over the UCMR. The Amendments further required systems to notify customers of the availability of the results of the UCMR on the Internet and to report any detections of UCMR study compounds on Consumer Confidence Reports (Federal Register, 1999). The new UCMR was to continue to be implemented on a five-year schedule.

The final revised UCMR was published in the Federal Register on September 17, 1999.

**Contaminants to be Monitored Under the UCMR and the Three-tiered System**

The proposed contaminants to be monitored in the UCMR were selected primarily from the 1998 Contaminant Candidate List (CCL) which was also established under the 1996 Amendments to the SDWA (Federal Register, 1999). The CCL is a list of contaminants not regulated under the National Primary Drinking Water Standards of the SDWA. This list was formulated through a workshop held by EPA in December 1996. At this meeting, a workgroup was formed to work under the National Drinking Water Advisory Council. This workgroup, the Working Group on Occurrence and Contaminant Selection, consisted of a variety of stakeholders including representatives from utilities, environmental groups, state regulatory agencies, and other parties. Together with EPA, this work group established criteria for candidacy on the CCL. The criteria fell mainly on two questions: 1. “Does the contaminant have adverse health effects?” and 2. “Is the substance known to or likely to occur in drinking water at levels and in a frequency that stands to significantly impact human health?” The list of contaminants was created and then sent out for peer review (EPA, 2003g).

The CCL was divided into three sections: Research Priorities, or contaminants that need research done on methods, Occurrence Priorities, or contaminants that need occurrence data to support regulation, and Regulation Priorities, or contaminants that are awaiting a regulatory decision. A new CCL list was to be created every five years.

Thirty-four contaminants on the CCL were selected for the UCMR. In addition, two radionuclides were added during the development of the UCMR due to emerging concerns of their potential to occur in drinking water (Federal Register, 1999).

While all the contaminants on the CCL list were of concern, not all of them had analytical methods ready to determine their presence in drinking water at the time of
regulation development. Furthermore, the thirty-six contaminants selected exceeded the limit of 30 set forth in the 1996 revisions of the SDWA. To deal with these two issues, the EPA created a three-tiered list system for the contaminants to be studied under the UCMR, based on the availability of analytical methods.

List 1 (Table 1), which was known as Assessment Monitoring, contained twelve chemical compounds for which EPA had methods available (Federal Register, 1999). These substances are detectable by methods that are regularly used in SDWA Compliance Monitoring. The term Assessment Monitoring refers to the fact that a large population of PWSs would be monitoring for these contaminants, thus giving more occurrence data and weight to any regulatory decision. The number of systems sampling for List 1 will be discussed more in the following sections of this chapter.

Five of the List 1 compounds, 2-chloro-N-(ethoxymethyl)-N- (2-ethyl-6-methylphenyl) acetamide (Acetochlor), dimethyl chlorthal di-acid and mono acid degradate (Dacthal, DCPA), S-ethyl dipropylthiocarbamate (EPTC), S-ethyl hexahydro-1H-azepine-1-carbothioate (Molinate), and 5-chloro-3-tert-butyl-6-methyluracil (Terbacil) are herbicides used for agricultural applications. 2,4-dinitrotoluene and 2,6-dinitrotoluene are used in making explosives. Perchlorate is a by-product of the combustion of solid rocket fuel, fireworks, and road flares. 4,4'-dichlorodiphenyldichloroethylene (DDE) is a degradate of the banned pesticide DDT. Methyl-tert-butyl ether (MTBE) is used in gasoline as an octane enhancer to increase the efficiency of combustion in engines that use unleaded gasoline. Finally, nitrobenzene is used in the production of some herbicides and dyes.
<table>
<thead>
<tr>
<th>Contaminant</th>
<th>CASRN</th>
<th>Use or Environmental Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-dinitrotoluene</td>
<td>121-14-2</td>
<td>Used in the production of isocyanate and explosives</td>
</tr>
<tr>
<td>2,6-dinitrotoluene</td>
<td>606-20-2</td>
<td>Used as a mixture with 2,4-dinitrotoluene (similar uses)</td>
</tr>
<tr>
<td>Acetochlor</td>
<td>34256-82-1</td>
<td>Herbicide used with cabbage, citrus, coffee, and corn crops</td>
</tr>
<tr>
<td>DCPA mono acid; DCPA di acid</td>
<td>887-54-7; 2136-79-0</td>
<td>Degradation products of DCPA, a herbicide used on grasses and weeds with fruit and vegetable crops. Both the DCPA degradates are measured and reported as a single analyte</td>
</tr>
<tr>
<td>4,4'-DDE</td>
<td>72-55-9</td>
<td>Degradation product of DDT, a general insecticide</td>
</tr>
<tr>
<td>EPTC</td>
<td>759-94-4</td>
<td>Herbicide used on annual grasses, weeds, in potatoes and corn</td>
</tr>
<tr>
<td>Molinate</td>
<td>2212-67-1</td>
<td>Selective herbicide used with rice, controls watergrass</td>
</tr>
<tr>
<td>MTBE</td>
<td>1634-04-4</td>
<td>Octane enhancer in unleaded gasoline</td>
</tr>
<tr>
<td>Nitrobenzene</td>
<td>98-95-3</td>
<td>Used in the production of aniline, which is used to make dyes, herbicides, and drugs</td>
</tr>
<tr>
<td>Perchlorate</td>
<td>14797-73-0</td>
<td>Oxygen additive in solid fuel propellant for rockets, missiles, and fireworks</td>
</tr>
<tr>
<td>Terbacil</td>
<td>5902-51-2</td>
<td>Herbicide used with sugarcane, alfalfa, and some fruit, etc.</td>
</tr>
</tbody>
</table>

List 2 (Table 2), or the Screening Survey, was made up of thirteen chemical compounds and one microbial agent. These were separated from List 1 because EPA had analytical methods that were concurrently in development with the regulation development (Federal Register, 1999). These compounds were also monitored for by a smaller group of PWSs. Thus, the name Screening Survey refers to the fact that the smaller sample size lead to less robust statistical data. It was also believed that these compounds were less likely to occur in drinking water. The anticipation was that, if found, these contaminants would be promoted to List 1 for Assessment Monitoring in the next cycle of the UCMR to gather more thorough occurrence data. Again, the contaminants were primarily insecticides and herbicides. Nitrobenzene occurred on both List 1 and List 2, as the analytical method used for each list was different. The List 2 method had a lower detection limit than the List 1 method. As a result, the List 2 Nitrobenzene was sometimes called low-level nitrobenzene. Aeromonas, the only microbe in the UCMR, were common in drinking water and some species have been correlated with cases of gastroenteritis. Finally, there was one group of explosive
derivatives, collectively called RDX, that did not have a method developed in time for this round and was reserved. So, while it was initially listed as a List 2 compound, there was no method available and it was reserved.

As methods became available, several additional rules were promulgated for the contaminants on List 1. The List 2 chemical rule was promulgated on January 11, 2002 and issued the required methods for monitoring the List 2 chemical compounds under the UCMR. The List 2 Microbiological Rule, or the *Aeromonas* Rule, was promulgated on October 22, 2002. This rule promulgated EPA Method 1605 for the analysis of *Aeromonas spp.* at the genus level.

<table>
<thead>
<tr>
<th>Contaminant Name</th>
<th>CASRN</th>
<th>Use or Environmental Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2-diphenylhydrazine</td>
<td>122-66-7</td>
<td>Used in the production of benzidine and anti-inflammatory drugs</td>
</tr>
<tr>
<td>2-methylphenol</td>
<td>95-48-7</td>
<td>Released in automobile and diesel exhaust, coal tar and petroleum refining, and wood pulping</td>
</tr>
<tr>
<td>2,4-dichlorophenol</td>
<td>120-83-2</td>
<td>Chemical intermediate in herbicide production</td>
</tr>
<tr>
<td>2,4-dinitrophenol</td>
<td>51-28-5</td>
<td>Released from mines, metal, petroleum, and dye plants</td>
</tr>
<tr>
<td>2,4,6-trichlorophenol</td>
<td>88-06-2</td>
<td>By-product of fossil fuel burning, used as bactericide and wood/glue preservative</td>
</tr>
<tr>
<td>Diazinon</td>
<td>333-41-5</td>
<td>Insecticide used with rice, fruit, vineyards, and corn crops</td>
</tr>
<tr>
<td>Disulfoton</td>
<td>298-04-4</td>
<td>Insecticide used with cereal, cotton, tobacco, and potato crops</td>
</tr>
<tr>
<td>Diuron</td>
<td>330-54-1</td>
<td>Herbicide used on grasses in orchards and wheat crops</td>
</tr>
<tr>
<td>Fonofos</td>
<td>944-22-9</td>
<td>Soil insecticide used on worms and centipedes</td>
</tr>
<tr>
<td>Linuron</td>
<td>330-55-2</td>
<td>Herbicide used with corn, soybean, cotton, and wheat crops</td>
</tr>
<tr>
<td>Nitrobenzene</td>
<td>98-95-3</td>
<td>Used in the production of aniline, which is used to make dyes, herbicides, and drugs</td>
</tr>
<tr>
<td>Prometon</td>
<td>1610-18-0</td>
<td>Herbicide used on annual and perennial weeds and grasses</td>
</tr>
<tr>
<td>Terbufos</td>
<td>13071-79-9</td>
<td>Insecticide used with corn, sugar beet, and grain sorghum crops</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contaminant Name</th>
<th>CASRN</th>
<th>Use or Environmental Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aeromonas</em></td>
<td>N/A</td>
<td>Present in all freshwater and brackish water</td>
</tr>
</tbody>
</table>

Finally, List 3, Pre-screen Testing of Contaminants Needing Research on Methods, contains a list of nine contaminants. Two, Lead-210 and Polonium-210 are radionuclides. The rest are microbiological agents including Cynobacteria, Echoviruses, Cocksackieviruses, *Helicobactor pylori*, *Microsporidea*, Calciviruses, and Adenoviruses. Except for *Helicobactor pylori*, these are all broad groups of microbials at either the
EPA had not developed methods to analyze these contaminants and also felt that they were generally of very limited occurrence due to site-specificity. Thus, they are reserved until appropriate methods for detection can be developed.

In the end, twenty-six contaminants were being monitored during this cycle of the UCMR. There were also ten contaminants reserved until methods could be developed. EPA chose to leave room under the thirty-contaminant maximum level for the reserved contaminants and any other contaminant that might have developed into a concern during the UCMR cycle.

**Public Water Systems Subject to the UCMR**

The public water systems for the UCMR were divided into two groups, large and small, based on population served. A large water system was defined as a system serving more than 10,000 people. Conversely, a small water system served less than 10,000 people. All large water systems were required to monitor for List 1 contaminants (Federal Register, 1999). A statistically chosen subset of 800 small water systems was also required to monitor for List 1 contaminants (Federal Register, 1999).

For the List 2 contaminants, 240 large systems and 360 small systems were required to monitor (Federal Register, 1999). These systems were statistically chosen from the larger pool of large and small systems that were required to monitor under the UCMR. These were further broken down as the systems selected for List 2 monitoring were segregated into groups monitoring for the twelve chemical compounds and groups monitoring for *Aeromonas*. In all, 120 large and 180 small public water systems were chosen to monitor for the chemical compounds and a different set of 120 large and 180 small PWSs were chosen to monitor for *Aeromonas*.

The only public water systems that were exempted from monitoring under the UCMR were those that either were transient water systems, systems that purchased 100% of their water, or systems that served less than 1,000 people. Transient water systems are systems that serve a population that is not considered stable. For example, a national park would be considered a transient water system as many people from various areas use it for short periods of time (Federal Register, 1999).
Finally, there were thirty small systems that were statistically selected out of the set of 800 that were required to monitor for List 1 contaminants as Index systems. These systems were to monitor every year of the current UCMR, from 2001-2005. This was done to gather further information on temporal variability of the contaminants and how operations at the monitoring plant might affect them (Federal Register, 1999).

**Sampling Under the UCMR**

All List 1 large systems were required to sample for one year during 2001-2003. List 1 small systems were also required to sample for one year during this period but the sampling was dictated either by the state, through a state-monitoring plan (SMP), or the EPA. List 2 small systems were required to monitor for the chemical compounds sampled in 2001. List 2 large systems that were required to monitor for the chemical compounds sampled in 2002. Finally, all systems were required to monitor for List 2 \textit{Aeromonas} in 2003 (Federal Register, 1999).

Sampling for public water systems where the water source is surface water, such as reservoirs, lakes or rivers, or where the source is ground water that is directly under the influence of surface water, were required to monitor quarterly. Those that use ground water as a source were required to monitor twice a year, once during the period of May-July when the water was considered vulnerable to contamination, and once five to seven months prior to or after the vulnerable period sample. The vulnerable period was selected because it occurred directly after application of herbicides and pesticides in the spring and also during the time when runoff from spring rains was considered high. As many of the contaminants were herbicides and pesticides or their derivatives, it was thought that this time period would be when the water systems were most vulnerable to contamination. The exception to the sampling rule was the systems that sampled for \textit{Aeromonas}. These systems were required to sample six times a year, once during the first, second, and last quarter of 2003 and once during each month of July, August, and September. The latter three months were considered the vulnerable period for \textit{Aeromonas}.

The sampling occurred at the entry point to the water distribution system for all List 1 and List 2 chemical monitoring. This rule was relaxed for surface water PWSs that
did their regular SDWA compliance monitoring at the source of their water supply (i.e.,
directly from the reservoir). However, detections in a source water sample triggered a
required resample at the entry point.

As in the previous case, *Aeromonas* took a slightly different track in sampling
design. For the *Aeromonas* monitoring, sampling was conducted in the distribution
system at three points: the mid-point of the distribution system (MD), the lowest
disinfectant residual point (LD), and the maximum residence point in the distribution
system (MR). The MD was in the approximate middle of a PWS distribution system, the
LD was at the point where the expected lowest amount of disinfectant occurred, and the
MR was the point where the water had been in the distribution system the longest.

**Reporting Results of the UCMR Monitoring**

After the samples were collected and analyzed, the results were sent to EPA.
There were several ways in which this occurred based on the size of the system that was
monitoring and which contaminants were being monitored.

All large PWSs reported their data, with the exception of *Aeromonas* to the online
temporary storage database known as the Safe Drinking Water Accession and Review
System (SDWARS). This database served as a holding tank for all large List 1 data. The
system was set up so that a laboratory, acting on behalf of the system, could report
analytical data directly to EPA through SDWARS. This could be done in one of two
ways, a web-based interface where the data is manually entered, or the submission of a
flat file. A flat file allows the laboratory to upload a large amount of data automatically.
Once the data was entered in SDWARS, a series of approvals commenced (Figure 5).
First, the laboratory reviewed the data and approved it. Then, a representative of the
public water system was able to review and approve it. It then could be reviewed and
approved by a representative of the state with primacy over the PWS. At that point, the
data was sent to EPA. After EPA reviewed and approved the data, it was sent to the
NCOD for public review. The NCOD data is available at this location:
http://www.epa.gov/safewater/data/ucmrgetdata.html. This system of data checks was required by
EPA as part of an agreement struck with the American Water Works Association. EPA
agreed not to look at the data until it was approved by a representative of the water system. It also helps with the quality assurance that the data is correct.

This system of handling data was unique to the UCMR. In most instances, the water system itself would enter the data but EPA felt that the laboratories were in a better position to ensure analytical accuracy for the results.

Figure 5: The flow of large system data in the Unregulated Contaminant Monitoring Regulation (EPA, 2003j)

1 The results of unregulated contaminant monitoring must be reported within 30 days following the month in which the system received the results from the laboratory. For example, if the system receives monitoring results on February 14th from the laboratory, the system or laboratory must report the results to EPA no later than March 30th. Electronic indication of approval of data is necessary for EPA to gain access to data.
All small system data and large system *Aeromonas* data was handled separately of SDWARS and internally by EPA. All small system analytical results were reported directly to EPA from the laboratories. An internal quality control check was performed and payment was issued to the laboratories. This data was then joined with the EPA reviewed large system data and sent to NCOD.

Of particular interest to this internship was the reporting of the large system *Aeromonas* data, in which the author played a large role. This will be discussed further in later chapters, but basically EPA set up a system of emailing spreadsheets to collect the data generated through the large system *Aeromonas* monitoring.

**Next Steps**

After the data leaves TSC and is posted on NCOD, the UCMR process is over. What remains is a determination of whether regulation is necessary for a given contaminant. Although it is beyond the scope of the UCMR, the author feels that it is important to relate what the steps are that occur leading to a contaminant being monitored in the UCMR to it being regulated as a National Primary Drinking Water Standard under the SDWA.

EPA goes through three steps in setting drinking water standards, considering public input throughout the process. The first two, identifying drinking water problems and establishing priorities, have already been discussed. Drinking water problems are identified in the creation of the CCL. Priorities are established when the CCL list is sectioned into research priorities, occurrence priorities, and regulation priorities. The occurrence priorities are monitored, assuming methods are available, in the UCMR. Health effects information is gathered for the contaminants in the research priority category. The occurrence data, combined with the health effects data, provide information that indicates whether or not a given contaminant should be regulated (EPA, 2003k).

Once a decision is made to regulate, EPA sets a Maximum Contaminant Level Goal (MCLG) based on the gathered health effects information. This goal is set at the level in which no known or anticipated adverse health effects in a person would occur. This only takes into account public health and does not consider method detection limits
or water treatment. An enforceable Maximum Contaminant Level (MCL) is then set by EPA. The SDWA requires that the MCL be as close to the MCLG as possible given the best available technology. If an MCL can not be achieved due to an exceptionally low detection level for a contaminant, a treatment technique can be substituted. This technique is an enforceable procedure or technology that must be used in order to ensure that the contaminant does not occur at harmful levels (EPA, 2003k).

After the MCL or treatment technique is set, a cost benefit analysis is conducted to make sure that it is economically feasible. The MCL may be adjusted to allow the highest health benefit at the lowest possible cost. After the standard is finalized, it becomes part of compliance monitoring under the SDWA in three years (EPA, 2003k).
CHAPTER 4
ROLES AND RESPONSIBILITIES OF THE INTERN

Overview

During the internship with TSC, the author performed several functions. These will be detailed more fully in the sections to come, but this overview provides a brief summary of the roles of the intern. The author served primarily as an outreach coordinator for the UCMR team. The major function in this role was to act as the editor of the quarterly newsletter, the *UCMR Update*. The author also managed the large system *Aeromonas* data reporting system. He further served as an interface between the stakeholders and EPA regarding questions concerning the implementation of the UCMR. Finally, the author served as a tester for the SDWARS data system.

Outside of the UCMR, the author served to validate two laboratory chemistry methods: Standard Method 5910B (SM 5910B) and the proposed EPA Method 415.3. These methods both dealt with assessing the UV-absorbing carbon compounds present in a water sample through spectroscopic analysis.

The *UCMR Update*

The *UCMR Update* is a quarterly newsletter that is distributed to approximately 1,200 entities involved in the UCMR. All 800 small systems in the UCMR receive a copy of the newsletter, as well as ~300 large systems and 100 assorted state, laboratory, and regional EPA officials. It is also posted on EPA’s website. The purpose of the *Update* is to inform those involved with the UCMR of upcoming events, new requirements, changes, and other aspects of the UCMR that EPA would like highlighted. The *UCMR Update* is different from many other EPA issued documents in that it is not purely technical in nature. The goal of the *Update* is to both inform and entertain the readership. The audience of the *UCMR Update* was taken into careful consideration when the verbal style was decided upon. The audience had a very wide range in educational levels, from high school to post graduate. Thus, EPA attempted to find a balance between reporting the technical aspects of the UCMR in a manner, which could be understood by all, and conforming to the technical standards that EPA is known for.
Also, since much of the material is rather dry, it had to involve some humor to keep the readership amused and engaged in the material. All of this required a lot of thought and hopefully cleverness by the author.

The author of this document was not the first editor of the *UCMR Update*. The first two issues were published by James Walesek, a former EPA employee with TSC. A third issue was published by a former ORISE Intern, Rayshaw Askew. These editions can be found in Appendix A of this report. The author issued three publications of the *Update* during his internship, one in August of 2002, one in November of 2002, and one in April of 2003. This are all catalogued in Appendix C of this document. The author used the basic style of the previous issues but made several changes that he felt improved the overall appearance and quality of the *Update*. The first of these changes was to create a title box that includes the name of the publication, the issue number, and the name of the editor. This was done in the hopes of making the *Update* look a little more like an actual news publication. A box that appeared under the title box was added to give a title to that particular issue of the *Update*. It was meant to be humorous and at the same time give an indication of what that issue was generally going to cover. The first issue that the author published (Appendix B), had the title of “Everything You Always Wanted to Know About *Aeromonas* but were Afraid to Ask.” It came out shortly after the promulgation of the *Aeromonas* Rule to the Federal Register which established EPA Method 1605 as the vehicle to measure *Aeromonas* for the UCMR and also set January 2003 as the beginning of the *Aeromonas* sampling period. Thus, Issue 4 of the *Update* was meant to inform the water systems exactly what was going to occur in the monitoring of Aeromonas and gave a little information about the microbe, *Aeromonas*.

The second addition that the author made to the *Update* was to include a calendar of upcoming events. This was done to give the casual reader who may not have had time to read the entire document a list of upcoming events that they needed to know about. This did not previously exist and was thought to be a good way to inform those that browse the *Update* of the important milestones that were coming up.

The third major addition the author added was the creation of the “Golden Faucet Award”. This first appeared in the April 2003 *UCMR Update*. It was meant to reward those people that showed an extra level of effort in some capacity within the
implementation of the UCMR. The Golden Faucet Award, or simply the Faucey, consisted of a certificate that was sent to the recipient (Appendix C) as well as recognition of effort in the *Update*. It was thought that this would be a good way to relate with the stakeholders who were working hand-in-hand with the EPA to implement the UCMR.

**Creation of the UCMR Update**

In general, the topics covered in the *Update* were those that had either been deemed as important and noteworthy by the author throughout the three months between issues or those that were suggested by other members of the UCMR team. The *Update* went through a comprehensive review process prior to it being issued. First, the author drafted the issue. An initial round of editing was performed by Chris Frebis. It was then sent out to all the other members of the UCMR team for comment. These comments were generally incorporated and then the issue was sent to Gregory Carroll for final comment. The comments made by Mr. Carroll were incorporated and then the document was sent both via email and regular mail, to the recipients. It was also posted on the Internet.

**Praise for the UCMR Update**

Throughout the author’s time as editor of the *Update*, several readers and stakeholders felt the need to comment on the content of the publication. All comments were favorable and, indeed, in high praise of the *Update*. These have been posted below:

> “Cory, thanks so much for your wonderful, humorous, communicative writing style---your update is so pleasantly readable and informative, that one cannot stop reading till the end. Further, because of the humor, one doesn't want to stop reading for fear of missing another laugh.

> In this frequently "burdensome-feeling" regulatory arena, light touches such, as yours are invaluable!!! Keep up the great work and you deserve every award you can come up with!”

Alexis Milea, P.E.
CaDHS Drinking Water Program
"I just read my first issue of the UCMR Update...would love to get it by Email regularly. (I received this issue third-hand from Montgomery Watson Labs.) I especially appreciate your tongue-in-cheek approach, and all the web sites you list...very helpful! Thanks!"

Stacey Roberts
Water Quality Specialist
Valencia Water Company

"A new issue of EPA's "UCMR Update" is now available

Commentary: Clearly, the most readable of USEPA websites."

www.safedrinkingwater.com,
January 8th, 2003. Volume 4, No. 2

"Cory: Thanks for getting back to me. I wanted to find out who the "editor/author" of the UCMR Update is so I can let you know how much your light touch is appreciated. The Update is very readable and enjoyable and that is not the norm for most EPA writings and especially for "data" related stuff.

Your fame is being spread via the free, weekly, online water quality newsletter, the safedrinkingwater.comNEWS which currently goes to over 5500 readers in the US and around the globe. Check us out at www.safedrinkingwater.com. Click on NEWS and then on View Previous Issues: Specifically, please look at the latest issue Vol 4, #2, 1-8-03 under ThisWeek's News and under the Federal Update category for UCMR references. We previously commented on the UCMR Update back in 3-6-02, Vol 3, #10. We liked it then.........it may have been done by your predecessor, Rayshawn Askew, but we like it even more now. Somehow we missed your Update #4, I guess.

Please keep up the good work and keep EPA loosened up! If you have any kind of list to notify readers when your new Update is posted, I would appreciate being notified.
Otherwise, we will keep our eyes open!"

Chet Anderson, Sr. Editor
safedrinkingwater.comNEWS

All of these comments were unsolicited and show appreciation for the effort that EPA made to have the UCMR Update be informative and enjoyable.
Experience Gained through the *UCMR Update*

The author feels that the experience gained while serving as the editor of the *UCMR Update* will be crucial to his future development as an environmental scientist. Writing it helped the author to gain valuable experience in technical writing as well as composing a document aimed at multiple audience groups. It also allowed him the freedom of having total project control over a publication with a fairly large readership. This helped the author gain management and organizational skills. Finally, the *Update* helped to improve the author’s communication and teamwork skills.

**UCMR Large System *Aeromonas* Data Coordinator**

The Monitoring Review Sheet

Prior to the collection of samples for *Aeromonas* under the UCMR, EPA sent out a one page document known as a Monitoring Review Sheet (MRS) (Appendix D). This sheet was sent in order to collect information about the PWSs that would be monitoring for *Aeromonas*. This information included the name, address, phone number and email of the representative of the PWS who was to serve as the contact point for EPA regarding the *Aeromonas* sampling. It also included a choice of three monitoring schedules, which would determine the months that the system would collect *Aeromonas* samples. There was also a section to give the sample point ID and name for the three distribution system sample points that were required under the rule. The intern was directly responsible for reviewing the data sheets and following up if any information was incorrect or missing.

Large system *Aeromonas* data reporting was handled in a different manner than all other data collected by the UCMR. As SDWARS was not designed to handle the extra water quality parameters that had to be collected with the *Aeromonas* data, it could not be used as a vehicle for the data reporting. EPA decided to use an in-house data reporting system based on Excel® spreadsheets and an email system. The spreadsheets were pre-entered with the EPA assigned PWS identification number and sample month as well as the required data fields (Appendix E). These spreadsheets were sent out via email
Once in the initial notification in November 2002 and once again in the month prior to each sampling month. This email notification was handled by the author.

After the spreadsheets were completed and returned to EPA, Chris Frebis examined them to ensure that the data was reported properly. Often, the spreadsheets were returned with fields missing, data apparently reported in the wrong units, and other mistakes. The author was in charge of correcting the spreadsheets and performing follow up emails and phone calls if necessary. The spreadsheets were then sent to Michael Cummins to upload into a database.

The author created an Access® database to track when a PWS had submitted a spreadsheet and what sampling requirement that spreadsheet fulfilled. This would then insure that no sample months were missed and allow the EPA to keep updated on who had reported data and who had not. It also allowed for the author to keep track of where a particular spreadsheet was in the reviewing process. The author also directly assisted stakeholders with questions and concerns about the Aeromonas reporting process.

Experience Gained as the UCMR Large System Aeromonas Coordinator

The author learned several important skills as the UCMR Large System Aeromonas Coordinator. First of all, he learned how to better communicate with stakeholders in order to assist with implementation of a rule. Interacting with a public that can be, to varying degrees, resentful, fearful, angry and friendly took a lot of patience. As in the editing of the Update, it was also a bit of a challenge dealing with people of varying educational backgrounds. Often, the callers were either fearful of getting fined due to missing a sample period or not understanding what they were to do, or they were angry about having to sample in general. The author found that the best way to approach both cases was to adopt a friendly demeanor and let the caller know that EPA was there to assist in compliance, not just fine everyone and anyone. The author also learned to carefully document conversations and store emails so that no one could attempt to interpret a conversation so that it qualified their position. This happened once in which a PWS representative missed a sample and wasn’t able to resample. The representative was told that TSC was not responsible for enforcement action as related to non-compliance with the UCMR. He was also told that TSC felt that he made a good
faith effort to comply and wouldn’t recommend any actions be taken. This was later incorrectly interpreted by the representative, in an email to EPA, that no resample was required and no enforcement action would be taken. The importance of having documentation was highlighted in this transaction, as the author was able to defend what his actual statements were through the comment tracker database. This database was used to give the time, date, and general content of any conversations between stakeholders and EPA in order to have a record of the conversation.

This position also allowed the author to gain skill at organization and management as he was basically in charge of making sure that the data reported to EPA was in a form that could be released to the public. With 300 PWSs reporting six times in one year, there were literally thousands of spreadsheets to keep track of and organization was crucial.

Finally, this position allowed the author to construct an Access® database for a real purpose. It allowed him to gain skill in Access®, which is important as many of the databases used by EPA are in the Access® format. For example, all the UCMR data that came to EPA was transferred from the online SDWARS database to the EPA UCMR database. The Agency as a whole is shifting towards increasing the use of such systems.

**SDWARS Testing**

Another role filled by the intern was that of a tester for the SDWARS database. Throughout the UCMR, SDWARS, the database that stored all the UCMR data, was constantly upgraded to enhance performance. These upgrades needed to be tested before they could be brought up to the main database. As is often the case in data systems, when one thing is fixed, another breaks. Thus, the role of the tester is to make sure not only that the change has been implemented properly, but also that no new “bugs” or errors have occurred as a result of the fix. The author tested the SDWARS database several time during the year internship at EPA. In his initial testing, he found a bug that caused a misassociation of laboratory sample IDs to samples in a given water system. The samples in the SDWARS system are identified by what are known as primary keys. These primary keys include the PWS ID number, the facility ID or IDs within the PWS, and the sample point IDs within the facility. The laboratory doing the analysis assigned a
laboratory sample ID to a given sample. It then assigned the sample to a batch. A laboratory batch is a group of samples that were run together and have undergone a group quality control check. In the system, all samples must be assigned to batches. The bug that the intern found occurred when the laboratory used the same sample ID for different batches. The samples would both be associated with the same batch instead of two different batches. For example, a laboratory might have given a sample an ID of (A) and assigned it with Batch 1. Later on, the laboratory might have again used the sample ID (A) and attempted to assign the new sample to Batch 2. The problem was that both samples ended up associating with Batch 1. This error was discovered in the test database and it was removed before it could be introduced to the actual production database.

Experienced Gained as a SDWARS Tester

Testing the SDWARS system allowed the author to gain experience in using an online data system. It also allowed him to learn some of the process behind how databases function and the correct way to create one so misassociations don’t occur. Furthermore, it allowed the author to have a better understanding of the SDWARS system and thus allowed him to help troubleshoot problems that stakeholders had with the system.

Laboratory Validation of Standard Method 5910B: Spectrographic Analysis of UV-Absorbing Organic Constituents in Water

Standard Method (SM) 5910B is used to get a general determination of the amount of organic material in water. Certain common organic compounds in water, such as tannins, lignin, humic acids, and aromatics, are known to strongly absorb ultraviolet (UV) radiation. This UV absorbance, generally performed at 254 nm, can often be correlated with the amount of total organic carbon, color, and precursors to disinfection by-products (DBPs) in water without having to sample for each individual compound. Thus, this method does not give a definite analysis of what organic carbon constituents are in water, but it does give an indication of the aggregate concentration of UV-absorbing organic constituents (Eaton, 1995). The method is fairly simple as it requires using a syringe to pass a water sample through a 0.45 um pore, 25 mm diameter disk
filter and into a sample cuvette. The filter is used to remove undissolved particles that might be found in water and would affect the absorbance reading. The sample is then analyzed in a spectrophotometer at 254 nm.

SM 5910B was one of the analyses used in the Information Collection Rule (ICR). EPA and TSC conducted the ICR as part of the SDWA from 1996 to 2000. One part of this rule was to gather occurrence data on DBPs within the nation’s public water systems. These DBPs are the result of the disinfectants used in water treatment reacting with natural organic substances in the water. These DBPs are possibly carcinogenic and the idea was to collect occurrence data to determine the need for the regulation of DBPs.

It was during the ICR that a PWS in Texas noticed that they would receive different absorbance readings for the same water sample based on the type of material contained in the filter that they were using. EPA believed that certain types of filters were either desorbing organic material into or adsorbing organic material from the water sample. Since the original method made no requirement of filter types, a study was conducted to determine which filter types had these flaws. At the conclusion of this study, EPA could modify the method to use specific filter types that did not have these problems. Alternatively, if the filter was shown to desorb material into a sample, a modification to the procedure that include a certain volume of water being used to wash the filter could be instituted. Or, if the filter was shown to be adsorbing material from samples, a modification could be made to require the passing of a certain amount of an organic standard to saturate any adsorption sites. The author was chosen by his mentor, R. Kent Sorrell, to perform this study.

The study was broken into two parts, a desorption, or leaching experiment, and an adsorption experiment. Unfortunately, due to time constraints within the author’s responsibilities to the UCMR, only a small pilot test of the leaching study had been performed at the time of this report. In this pilot study, five common filter types that were readily available in laboratory supply catalogs were chosen. These filters were made out of the following materials: Glass Micro Fiber (GMF), Nylon, Polyether sulfone(PES), Polyvinylidene fluoride (PVDF), and Polytetrafluoroethylene (PTFE) or Teflon.
The leaching procedure for this study was as follows:

1. Turn on Spectrophotometer. Adjust to 254 nm and allow to warm up for ½ an hour.

2. Rinse 5 cm path quartz cuvettes and a 10 mL syringe with reagent grade Millepore water.

3. Blank spectrophotometer with reagent grade water, approximately 10 mL, passed through the unfiltered syringe.

4. Draw 10 mL of reagent grade water into the syringe and apply the filter. Pre-rinse filter by passing water into it, until a drop forms on the tip (approximately 1 mL). Allow to stand for 1 minute.

5. Pass remaining water through filter into the cuvette.

6. Analyze sample.

7. Repeat Steps 4-6 with the same filter two times (a total of three washes).

8. Each filter type analyzed in triplicate.

9. Blank check performed every 10 samples.

10. Standard check (with potassium hydrogen phthalate (KHP)) performed every 10 samples.

11. Standard preparation: 138 mg of KHP was be measured out and dissolved in 500 mL of reagent grade water. 12.5 mL was added to 237.5 mL Phosphate Buffer. This gives a solution of 6.5 mg/L KHP and an absorbance of 0.1

Buffer preparation: Weigh out 4.08 g of KH₂PO₄ and 2.84 g of anhydrous Na₂HPO₄ and allow to dry overnight in a dessicator. Dissolve in 800 mL of reagent grade water and test pH. Bring volume up to 1000 mL.

After an initial display of capability analysis was performed, as was required by EPA, the author performed the pilot study. Three filters of each filter type were serially rinsed three times each with 10 mL of laboratory reagent grade water (LRW). The eluent from each rinse was captured in a 5-cm path length cuvette and analyzed at 254 nm. The expected reading for laboratory reagent grade water should be zero as it is water that has had all the impurities removed. As can be seen from Figure 6 nearly all the filters, with the exception of Nylon and PES, showed a leaching effect when initially rinsed with the reagent water. The GMF, PES, and PVDF filters all showed absorbances with the initial
wash, indicating some leaching of the filter material. Subsequent washes, however, showed very little absorbance. Preliminary indications were that a single 10 mL wash was enough to overcome the leaching effect on all the filter types. As three filters of each type were used in this study, the data is not very statistically significant. A larger study will need to be performed with a sample size large enough to quantify the effects seen here. It is the goal of the author to complete this entire study before his internship is finished.

**Laboratory Validation of Proposed EPA Method 415.3: Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water**

Proposed EPA Method 415.3 is to be used to determine the amount of organic carbon that is present in a drinking or source water sample. It is similar, although more encompassing, than SM 5910B and is intended to be an alternative to that method. The method is broken into two sections. The first is to determine the Total Organic Content
(TOC) and the Dissolved Organic Content (DOC) of a water sample using two different oxidation methods and a CO₂ detector. TOC is determined by combusting the organic carbon in a water sample in the presence of an oxidizing gas. DOC is determined by chemically oxidizing the carbon in a water sample with a persulfate solution and either an UV or thermal catalyst. The second portion of the method determines the UV absorbance of the carbon in the water sample at 254 nm using a simple spectrophotometer. The author’s function as a laboratory validator was to run the UV absorbance procedure portion of this method to see if it could be followed and achieve satisfactory results. This was broken down into several sections, which are described below.

**Initial Check of Spectrophotometer Performance**

Before any initial lab work could be done, the instrument had to be checked for performance to insure that it was operating within proper tolerances. This step is required prior to using a new instrument for this method. The performance check required testing the 0% Transmittance, Stray Radiant Energy, Wavelength Accuracy, Accuracy and Linearity, and Optical Alignment to insure the spectrophotometer was in good working order. The Standards used were Spectronic Standards- Registry No. 325DO74018 and Catalog No. 333510.

The 0% transmittance and stray radiant energy tests determine if the beam of the transmitter is focused properly and if the spectrophotometer is properly shielded. The procedure is as follows:
A. 0% Transmittance and Stray Radiant Energy Procedure:

1. Allow spectrophotometer to warm up 1 hour.
2. Set wavelength to 400 nm.
3. Set measurement to transmittance.
4. Zero with an empty cell.
5. Insert the 0% standard and record.
6. Replace with the Stray Radiant Energy (SRE) standard at 400 nm and record.
7. Subtract 5 from 6 and this is stray radiant energy.
8. Repeat with Stray Radiant Energy SRE 340 and 220 nm standards at the appropriate wavelength.

Table 3: Results of 0% Transmittance and SRE Tests

<table>
<thead>
<tr>
<th>Standard</th>
<th>Transmittance</th>
<th>Tolerance</th>
<th>0%-SRE</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0.4%</td>
<td>N/A</td>
<td>0-0.4%</td>
</tr>
<tr>
<td>400 nm SRE</td>
<td>0%</td>
<td>0.4%</td>
<td>0</td>
<td>0-0.4%</td>
</tr>
<tr>
<td>340 nm SRE</td>
<td>0%</td>
<td>0.4%</td>
<td>0</td>
<td>0-0.4%</td>
</tr>
<tr>
<td>220 nm SRE</td>
<td>0%</td>
<td>0.4%</td>
<td>0</td>
<td>0-0.4%</td>
</tr>
</tbody>
</table>

As can be seen from Table 3, the spectrophotometer showed no transmittance and no stray radiant energy at any of the wavelengths tested.

Next was the wavelength accuracy test. This procedure seeks to determine if the set wavelength of the spectrophotometer is correct. To do this, a homium oxide filter is placed in the spectrophotometer. The filter is then read at a specified wavelength where a known maximum or minimum in the filter’s absorbance spectrum occurs. The value obtained by the spectrophotometer at that wavelength should correspond to the predicted value of the spectrum if the generated wavelength is correct. The procedure is as follows:
B. Wavelength Accuracy Procedure

1. Place the Homium Oxide filter in the cell holder.

2. Set Wavelength to correspond with a calibration wavelength of homium oxide (between 220 and 340).

3. Adjust to both sides of the value until a minimum %T is obtained. It should correspond with the spectrum of homium oxide within tolerance.

The wavelengths chosen were 280 and 335 as the homium oxide had two defined minimums at these wavelengths and it also fit into the parameters of the experiment. The minimums were found to be at 280.4 and 335.6 which is within the tolerance of +/- 3 nm.

After the wavelength accuracy test comes the accuracy and linearity test. This test aim to determine if the reported transmittance value for the spectrophotometer is accurate and linear over time. The procedure is as follows:

C. Accuracy and Linearity Procedure

1. Set the wavelength to 590 nm.

2. Insert the optical test alignment piece.

3. Blank to read 100% T

4. Remove test piece

5. Put in the standard that is 50% T. Record.

6. Replace with 10% standard. Record.

<table>
<thead>
<tr>
<th>Standard</th>
<th>%Transmittance</th>
<th>Known Value of Filter</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% T</td>
<td>51.6</td>
<td>51.4</td>
<td>+/- 1.2%</td>
</tr>
<tr>
<td>10% T</td>
<td>9.0</td>
<td>9.1</td>
<td>+/- 1.2%</td>
</tr>
</tbody>
</table>

As can be seen from Table 4, the results were accurate at the 590 nm wavelength and also held their linearity over the transmittance range.

The optical alignment test aims to make sure that the spectrophotometer beam is aligned properly and thus passes directly through the slit of the cuvette holder. The procedure is as follows:
D. Optical Alignment Test Procedure

1. Turn spectrophotometer off.
2. In subdued light, open the light sensitive paper.
3. Cut sheet to fit holder.
4. Insert sheet in holder.
5. Set Wavelength to 425 nm.
6. Expose for 3-24 hours.
7. Expose to Ammonium fumes to develop.
8. Compare beam pattern to cell.

The beam pattern showed no misalignment between the beam and the cell.

Spectrophotometer Standards Performance Check

Prior to each individual run of the 415.3 method, a standards performance check is required. This check involves using a potassium hydrogen phthalate standard of known concentration and absorbance at a given wavelength to insure that the spectrophotometer is operating correctly. All sample cells used in this procedure were 1-cm path length quartz and were cleaned with DI water, methanol, and then reagent grade Nitrogen. The procedure is as follows:

1. Fill cell with KHP blank (PBS Buffer) and blank spectrophotometer.
2. Clean cell.
3. Fill with KHP-Check Standard(CS)((6.5 mg/L-Abs. @ 254=.1)
4. Check solution.
5. Clean cell
6. Add Lab Reagent Water (LRW) to cell.
7. Measure Absorbance.
The value determined for the KHP-CS was .96, which was within the 10% tolerance limit of the known absorbance value. The value of the LRW was -.005 which is less than the acceptable limit of .1. The spectrophotometer was found to be working properly.

Desorption Test

All water samples tested under method 415.3 are first filtered using a .45 um syringe filter to remove any undissolved impurities. However, these filters have the potential to desorb organic material from or leach organic material into a water sample, depending on the material that they are constructed from. Thus, it is important to determine first whether a filter is going to take add any organic carbon to a sample and thus affect the results of the UV test. The desorption test is thus performed to see if significant amounts of material are desorbed into a sample by the filter. If they are, then another type of filter must be used.

All cells used in this procedure by the author were 1-cm path length quartz and were cleaned with DI water, methanol, and then reagent grade Nitrogen. Filters used were made of Polyether sulfone (PES) from Whatman (Catalog #6896-2504, Pore Size .45 um, Diameter 25 mm, Lot #10966). The procedure was as follows:

1. Filter 100 mL of LRW through filter.
2. Test a filter blank (LRW through filter). Pass 3 mL of LRW into cuvette.
3. Repeat steps 1 and 2 with two different filters of the same material.
4. Blank with unfiltered LRW.
5. Read absorbance of the samples.

<table>
<thead>
<tr>
<th>Filter Number</th>
<th>Absorbance @ 254 nm</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.005</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>2</td>
<td>.003</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>3</td>
<td>.005</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

As can be seen from Table 5, the PES filters did not appreciably desorb, or leach, any material into the pure water sample. Thus, the PES filters were appropriate to use for this assay.
Filter to Waste Assay

As mentioned previous, filters can alter the results of this type of analysis by either desorbing material into the sample or adsorbing it from the sample. The filter to waste procedure determines how much of the sample or a check standard must be filtered passed through a new filter in order to saturate any potential adsorption sites. This gives the filter-to-waste volume or the amount of sample or standard that needs to pass through a filter before the samples can be assayed for UV absorbance.

All cells used in this procedure by the author were 1-cm path length quartz and were cleaned with DI water, methanol, and then reagent grade Nitrogen. Filters used were made of PES from Whatman (Catalog #6896-2504, Pore Size .45 um, Diameter 25 mm, Lot #10966). The procedure is as follows:

1. Blank Spectrophotometer with Reagent Grade water.

2. Filter 10 mL of 6.5 mg/L KHP (Abs=.1) with PES filters into cuvette.

3. Read Absorbance.

4. Repeat Steps 2 and 3 twice.

<table>
<thead>
<tr>
<th>Filter Number</th>
<th>Rinse Volume (mL)</th>
<th>Abs.</th>
<th>Tolerance</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>.073</td>
<td>.85-.115</td>
<td>Fail</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>.090</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>.091</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>.076</td>
<td>.85-.115</td>
<td>Fail</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>.090</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>.087</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>.072</td>
<td>.85-.115</td>
<td>Fail</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>.086</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>.090</td>
<td>.85-.115</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Based on these results in Table 6, it was thus concluded that 20 mL is an appropriate filter-to-waste ratio to assure that any adsorption sites in the filter are fully saturated.

Again, this was all done to primarily determine if the procedure for Method 415.3 was written in a manner that it could be performed and achieve consistent and accurate results. The author determined that the procedure could be followed as written, that the
PES filter was appropriate for use in this study, and that the proper filter-to-waste ratio was at least 20 mL.

Experience Gained from Laboratory Validations

The laboratory validations did give the author some practical laboratory experience. It allowed him to practice his laboratory technique through the making of solutions from concentrate and to gain experience in operating a commercial spectrophotometer. It also gave the intern some insight into the process that governs the development of EPA laboratory methods. Laboratory analysis is one area that the author hopes to get further involved with during his time at EPA. He may have a future role in some methods development for the next round of the UCMR.
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

The author believes that his internship with EPA has been very compatible with the goals and objectives of IES and with his future plans. The internship has allowed him to gain an incredible amount of practical experience, including the participation in a national occurrence survey, the assisting the implementation of a federal regulation, the chance to have first hand contact with stakeholder groups outside of the government, the conducting of laboratory studies to assist method development, and the opportunity to create and edit a document read by over 1,000 people. Through this internship, the author has gained skills in technical writing, rule development and implementation, database creation and maintenance, and laboratory procedures. He has had the opportunity to work as part of interdisciplinary team of varying backgrounds in the environmental field.

The IES program prepared the author well for this internship and for a future in the environmental field. The author had already experienced being part of an interdisciplinary team before he came to EPA through the Public Service Project. The environmental policy and law classes gave him a primer for the way the federal government and the EPA operate as well as a strong background in the major environmental laws of the United States. The environmental toxicology class helped the author by providing a strong background in the classes, the effects, and the ways the effects are quantified for health studies. This aided in the intern’s understanding of the contaminants that were being monitored in the UCMR. Finally, the Principles and Applications course and the Community-involvement course helped prepare the author for associating with stakeholders and to act in a bottom-up instead of a top-down manner. This approach was something the author tried to bring to all aspects of the UCMR that he was involved in.

The author’s impression of EPA has not changed since the beginning of his internship. He still considers it one of the finest environmental regulatory agencies in the world. Working within EPA often required the utmost patience. It often seemed as though no matter what EPA did, no one was satisfied. There is a definite balance between trying to protect human health and the environment and still allowing industrial
interests to flourish. The author is still very much on the side of the environment, but realizes that business must exist and that pollution will occur as a result. It is impossible and impractical to operate in a “fine and forget” approach. EPA must work hand in hand with industry and environmental stakeholders in order to accomplish anything. This partnership is vital to the success of EPA. This may be the most important lesson of all.

It was sometimes frustrating to work within all the layers of government and politics in order to get the job done. Things that seemed obvious and easy sometimes took a lot of time to implement or could not be implemented at all. However, the author believes that EPA is moving in the correct direction in following a “sound science” policy to collect quality information and data before any regulations are enacted. It is important that all the facts are gathered and that EPA makes decisions on sound evidence.

The IES education prepared the author well for this internship. The PSP teams helped him to prepare to work in an interdisciplinary team with numerous skill sets. This is the norm within EPA project teams. The Risk Assessment and Policy courses gave the author the background preparation for working in the regulatory environment. The Toxicology course provided the intern with knowledge of many of the health effects measurements and general properties of the contaminants monitored in the UCMR. The Community Involvement course helped the author to interact with stakeholders in a manner that involved them fully and sought to engage their knowledge to aid the EPA’s mission.

As to the future, the author will continue with the EPA for another two years in his internship capacity. He hopes to work on the development of the UCMR 2 regulation, which will be implemented in 2005. Ultimately, he would like to continue with the EPA as he has found the work to be both challenging and rewarding. The author would perhaps like to move more towards the enforcement aspect of the EPA. All in all though, he has thoroughly enjoyed his time at EPA and in IES.
LITERATURE CITED


Appendix A

Previous Issues of the UCMR Update
UCMR Update
Jim Walasek, Editor
Technical Support Center
January 2001

UCMR
Premier Issue
UCMR Update Issue Number 1- This information sheet, the UCMR Update, is the first one to be issued by the Technical Support Center (TSC) of the Office of Ground Water and Drinking Water (OGWDW). Future issues will be distributed as needed to maintain information flow related to the UCMR.

Editor’s Note: The UCMR is a multi-tiered rule that was promulgated in the September 17, 1999 Federal Register starting on page 50556 (64 FR 50556). The three-tiered monitoring approach includes: Assessment Monitoring for the List 1 chemical contaminants, a Screening Survey for the list 2 chemical contaminants and Aeromonas, and the Pre-Screen Testing for List 3 contaminants (mostly microbiological contaminants). On December 18, 2000, the List 2 Rule was signed by EPA Administrator, Carol Browner and will soon be published in the Federal Register. Well, I don’t know about you, but for me, reading the Federal Register is a sure cure for insomnia. Therefore, one of the goals of this “rag” (the UCMR Update) will be to look at some of the major provisions of the Rule and attempt to put them into “plain language.”

Many of you just receiving this first issue of the UCMR Update have already received your notification of the start of the Assessment Monitoring phase of the Unregulated Contaminant Monitoring Rule (UCMR). Notification letters were sent out at the beginning of October to more than one-third of the total (800) randomly selected small systems (those PWSs serving 10,000 or fewer persons) by the States and in some cases, by the Technical Support Center here in Cincinnati. Many of the small systems that were notified have been scheduled to begin sampling in the year 2001. Because of their size, the small systems will be getting assistance in the analysis and reporting of their samples. EPA will pay for the assembly and shipment of the sampling kits to the utility, shipment of the water samples to the designated analytical lab for analysis, and data entry of the results by the labs. The small systems will do the actual collection of the samples, but in some cases even that may be done by others (e.g., State or USEPA Regional personnel).
In addition to the small systems, notification letters were also sent to the approximately 2700 large systems (serving more than 10,000 persons) that will be required to sample for the 12 contaminants on List 1. This list will more often be referred to as Assessment Monitoring. The large systems, by virtue of their size and staffing, will have to provide their own sampling kits, sample collection, and analytical services. They will also have to have their own results entered into the Internet-based data entry system.

In this first issue of the UCMR Update, we will look at Assessment Monitoring, Index Systems, Data Elements, Monitoring Frequency, the Small System Screening Survey, and Data Reporting. I have selected these topics because they will all be important in the coming year.

**Partnership is Formed** - Due to the size and scope of the UCMR, and the fact that EPA will be directly implementing the rule without required assistance from the States, it was set up as a voluntary partnership arrangement between EPA and the States/Territories. Most of the States did sign Partnership Agreements (PAs), while others only agreed to do certain aspects of the monitoring, but did agree, in a letter to EPA, to do these tasks. A few states said they would not take part in any of the UCMR activities, an action which required the USEPA to get involved directly with the utilities.

In addition to USEPA and the states, there are several other players in this undertaking. For instance, EPA Regional offices were responsible for negotiating the Partnership Agreements with the States. As monitoring begins, some EPA Regional offices will be collecting samples for systems as well as assisting with the review of data or assisting with compliance issues. Therefore, the EPA Regions should be the first contacts for questions concerning the UCMR.

EPA is also working with several contractors on implementation of the UCMR. First, Cadmus (an EPA contractor located in Massachusetts) has been responsible for randomly selecting the “small” PWSs for Assessment Monitoring and the Screening Surveys, as well as the large (serving over 10,000 persons) PWSs which will participate in the Screening Surveys. They also worked with the States to compile the State Monitoring Plans (SMP) and drafted all of the guidance documents.

Great Lakes Environmental Center (GLEC) was chosen as the small system implementation contractor for the UCMR. They will be responsible for coordination of the small system sampling effort including the design and shipment of sampling kits to the systems (or State/Regional samplers). They will also review data from the laboratory analysis of the small system samples. Furthermore, GLEC will be working with Montgomery Watson (MW) and Environmental Health Laboratory (EHL), who will perform the chemical analyses for all the small systems in the UCMR. Another contractor, the National Service Center for Environmental Publications (NSCEP) is assisting with all the mass mailings (of notification letters and the like) which need to be undertaken for the UCMR. Finally, Logistics Management Institute (LMI) is developing the web-based data entry system, as well as the format for transferring batch data.

Of course, there is even a partnership “within” the EPA to get the UCMR off the ground and running, involving several groups within the Office of Ground Water and Drinking Water. For example, the Targeting and Analysis Branch (TAB) was responsible for getting the Rule published. The Infrastructure Branch (IB) will be responsible for getting the data to Envirofacts. The Office of Environmental
**Information** (OEI) is responsible for getting the electronic data reporting system in shape. And last, but not least, the **Technical Support Center** (TSC), here in Cincinnati, is responsible for implementing the UCMR. TSC also played a significant role in the development of the Rule.

As you can see, the UCMR is truly a partnership arrangement. And TSC, for one, is looking forward to a successful partnership.

**List 2 Large Systems Revealed** - The list of large systems selected for the UCMR Screening Survey for List 2 contaminants is available for your viewing pleasure on EPA’s website at [http://www.epa.gov/safewater/standard/ucmr/list2largesystems.html](http://www.epa.gov/safewater/standard/ucmr/list2largesystems.html). The list consists of the 120 systems designated for 2002, and 120 systems selected for monitoring in 2003.

**Assessment Monitoring** - When you hear the words, Assessment Monitoring, think of List 1. This list contains 12 chemical contaminants, eleven of which can be analyzed using current analytical methods. A new method for the determination of perchlorate (EPA Method 314.0) was developed specifically for the UCMR. [Refer to Table 1 in the Rule (p. 50613) for the complete list.] Eleven of the contaminants are organics, while perchlorate, is an inorganic contaminant.

One year of Assessment Monitoring for the List 1 contaminants must take place during the period beginning January 1, 2001 and ending December 31, 2003. The schedule for Assessment Monitoring for small systems down to the year and month has already been determined from the State Monitoring Plans (SMPs). Our implementation contractor, GLEC, will soon be contacting the small systems to establish the exact week of sampling and to begin shipping sampling kits to the systems (or the State/EPA Regional samplers).

As for the large systems, they have been notified about the monitoring period for the List 1 UCMR contaminants, but have some discretion when it comes to the year in which they want to monitor. Large systems must provide their own sampling kits and collect their own samples and have them analyzed by an approved lab of their choosing. Their lab will enter the results into EPA’s electronic data reporting system (known as SDWARS and still under development), but the utility will have the opportunity to review data and the responsibility to approve the results through the same data reporting system.

**Index Systems** - The term “Index Systems” applies to the 30 randomly selected small systems that will be monitored over a five-year period for a wide range of parameters. These systems were selected randomly from the systems in State Monitoring Plans (SMPs). The purpose of this sampling program is to study the effect of temporal variation on contaminant occurrence and to provide additional information on small systems which can then be used to “tailor future regulations to small systems.”

EPA will pay for Index System monitoring (sampling equipment, shipment of samples, analysis, and data entry). In addition, a field technician will be available to each Index System to collect the samples. Additional system information will be collected initially “to characterize the environmental setting affecting the system.” Systems selected as Index Systems will receive further guidance from EPA in the weeks to come.

**Data Elements** - The 16 data elements which are to be reported include:
1. **PWSID Number** - 2 character postal State code (e.g., FL for Florida) followed by 7-digit number
2. **Sampling Point ID Number** - 3 part alphanumeric designation consisting of: the PWS Facility ID Number, the Sampling Point ID Number, and the Sampling Point Type ID. An example would be: 00105-00105E-SS
3. **Sample Collection Date** - date sample is collected in the format yyyymmdd
4. **Sample ID Number** - up to 15 alphanumeric characters assigned by the lab to identify water samples collected at the same time and location
5. **Contaminant/Parameter** - the name of the UCMR contaminant/water quality parameter for which the sample is being analyzed (e.g., MTBE)
6. **Analytical Results - Sign** - alphanumeric value of < (less than) or = (equal to)
7. **Analytical Result - Value** - actual numeric value of the analysis, or the MRL (min. reporting level)
8. **Analytical Result - Unit of Measure** - unit of measurement such as micrograms per liter (µg/L)
9. **Analytical Method Number** - ID number of analytical method such as, EPA 502.2
10. **Sample Analysis Type** - type of sample collected (one of 4 types: RFS (raw field sample), RDS (raw duplicate field sample), TFS (treated field sample), TDS (treated duplicate field sample)
11. **Sample Batch ID Number** - 3 part number consists of up to: 10 character lab ID code assigned by EPA, 15 character batch (extraction or analysis) code assigned by lab, date (yyyymmdd format) batch was extracted or analyzed
12. **Minimum Reporting Level** (MRL) - lowest concentration of an analyte that may be reported
13. **MRL Unit of Measure** - unit of measure such as micrograms per liter (µg/L)
14. **Analytical Precision** - degree of agreement between two repeated measurements. For the UCMR it is defined as the relative percent difference (RPD) between spiked matrix duplicates
15. **Analytical Accuracy** - describes how close a result is to the true value measured through the use of spiked field samples
16. **Spiking Concentration** - concentration of method analytes added to a sample for the purpose of calculating analytical precision and accuracy

**Monitoring Frequency** - The monitoring frequency for Assessment Monitoring varies from 4 times per year for surface water systems to just two times per year for groundwater systems. Sounds simple doesn’t it? *Au contraire.* One of the sampling times for surface water systems must fall between May 1st and July 31st (the so-called vulnerable period) while the other three sampling times must occur in the same relative month in each of the other quarters. For example, if you sample the vulnerable period in June, the other sampling must be done in March, September, and December (three months before and three and six months after the vulnerable period sampling). For groundwater, sample during one month of the vulnerable time (May 1st through July 31st) and during one month five to seven months earlier or later (e.g., if you plan to sample in June 2001, collect the other sample in either January 2001 or November 2001, December 2001, or January 2002). Now I’m confused. Good luck.
**Small System Screening Survey** - EPA divided the list of contaminants that systems must monitor for into 3 separate lists based on the availability of analytical methods. We have already discussed Assessment Monitoring, the List 1 contaminants. The Screening Survey or List 2 contaminants, consists of 13 chemical contaminants for which analytical methods will be available by the start of monitoring in 2001. Of the 800 randomly selected small systems, 180 small systems were randomly selected to begin monitoring for List 2 contaminants in 2001. (The 120 randomly selected large systems do not begin monitoring for List 2 chemical contaminants until January 2002.) A second Screening Survey for the List 2 microbiological contaminant, *Aeromonas*, will be performed by 180 other small systems in 2003. List 2 monitoring for small systems is scheduled in 2001 to run concurrently with List 1 (Assessment Monitoring) contaminant monitoring. Small system monitoring for List 2 contaminants is taking place before the large systems monitor for these contaminants because EPA is paying for the small system monitoring and hopes to gain some additional experience with the methods before the large systems (which must pay for their own monitoring costs) start their monitoring in 2002.

**Data Reporting** - Analytical data from the UCMR monitoring will be entered into a web-based data entry system known as SDWARS (for Safe Drinking Water Acquisition and Reporting System). This database system is currently under development and it is anticipated that it will be ready to accept data in June 2001. In the interim, it will be necessary for large systems and laboratories to participate in a registration process. Letters will be mailed to these systems and labs in January (or early February) 2001 announcing the start of registration and explaining the procedures to be followed. The registration process will probably (the details are still being worked out) involve submitting a list (on your “Official” letterhead) of potential users that will need access to the system for data entry and/or data review/approval. In turn, a letter will be sent to each potential user with detailed instructions on how to access the system along with a user ID and a temporary password. You will then be able to logon to the system (set-up a password of your choosing) and register for the purpose of entering and/or reviewing/approving UCMR data. More on the development of this system in the next UCMR Update.

**Perchlorate Labs Approved** - Just over 100 laboratories have been approved to conduct perchlorate analysis in support of List 1, Assessment Monitoring. These laboratories have successfully completed and passed either the Spring or the Fall 2000 Perchlorate Performance Testing (PT) Study. At the time of these studies, these laboratories were certified by a State or primacy agency to conduct compliance monitoring for at least one inorganic parameter using an approved ion chromatographic method. For a complete listing of these approved labs go to the EPA website at [http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html](http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html)

**Additional Information for Systems?** - Recently, many States have been contacted by their systems seeking more information about the UCMR. Help is on the way! Two new guidance documents are about to be released by EPA. One, titled *Unregulated Contaminant Monitoring Regulations Guidance for Operators of Public Water Systems Serving 10,000 or Fewer People* (whew, that’s a mouthful) EPA # 815-R-00-018, should help answer some of those nagging questions about the how, what, when, where of
UCMR Assessment Monitoring. It is currently on the safewater web site in draft form, but will be published soon and available through the Water Resources Center. Another guidance document with a similar “catchy” title, Unregulated Contaminant Monitoring Regulation Guidance for Operators of Public Water Systems Serving More Than 10,000 Persons, EPA # 815-R-00-012 is not yet ready, but should be soon. Another document (UCMR: Interim Update on Reporting) is being developed primarily for large systems and their laboratories that will provide an informational update on data reporting under the UCMR. Fact sheets are also being developed for both the large and small systems and may be included in the mailing explaining the registration process for the data system.

**List 2 Rule Final** - The final rule for List 2 was proposed in the September 13, 2000 Federal Register starting on page 55362 (65 FR 55362) and was signed by the EPA Administrator on December 18 authorizing the Rule as Final and its publication in the Federal Register. It may not be published in the Federal Register until January 2001; in the interim, a prepublication version is available on the web at http://www.epa.gov/safewater/standard/ucmr/prepubfinal_ucmr_list2.pdf.

The September 1999 UCMR included 3 lists of contaminants to be monitored: List 1 for contaminants with approved analytical methods, List 2 for contaminants with methods being refined, and List 3 for contaminants with methods being developed in research. This latest rule finalizes analytical methods for 13 (of the original 16) List 2 chemical contaminants and the monitoring schedule for the microbiological contaminant, *Aeromonas* (2003 - if the analytical method is promulgated in 2001). The rule also finalizes minor changes to the September 1999 UCMR that affect the implementation of monitoring for both List 1 and List 2 contaminants.

**When Contacting Us...** - Utilities, please use your PWSID Number (laboratories use your USEPA (EMSL) LAB ID number for lab related issues) as a reference in any written correspondence with the UCMR folks here at TSC. The address is:

UCMR Coordinator
Technical Support Center
U. S. Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, OH 45268

**Future Issues of the UCMR Update** - This issue of the UCMR Update is being sent to you to keep you abreast of the latest information on the UCMR. If you or someone else would like to receive future issues (limit one per entity, but feel free to copy), please fill out the form below and return it to the Technical Support Center in Cincinnati, or e-mail a short message with your mailing address to walasek.james@epa.gov to be placed on the mailing list. Thank you.
Yes, I would like to receive future issues of the UCMR Update. My current mailing address is:

Name:_________________________________________
PWSID# (or USEPA Lab ID#): ~~~~~~~~~~~
PWS (or Lab) Name:_____________________________________
Mailing Address:________________________________________________________
City:________________________________
State:__________ Zip: ___________

Mail to: Jim Walasek, U.S. EPA, 26 W. M. L. King Dr. (MS-140), Cincinnati, OH 45268
UCMR Monitoring Continues...into a NEW YEAR!

UCMR Update Issue Number 3 - This information sheet, the UCMR Update, is the third one to be issued by the Technical Support Center (TSC) of the Office of Ground Water and Drinking Water (OGWDW). Future issues will be distributed as needed to maintain information flow related to the UCMR.

Editor's Note: We apologize for the delay in publishing Issue 3, as the latest version of the UCMR Update. For those of you that may not recall, UCMR is the acronym for the Unregulated Contamination Monitoring Rule. Our former editor, Jim Walasek, chose to retire last Spring (sailing must be more fun than editing) and in his absence, his supporting role and contributions as a member of our UCMR implementation team became painfully evident. Recently, Rayshawn Askew has stepped in to take his place in bringing you the latest news on the UCMR as editor of a reader friendly newsletter that is guaranteed to keep you awake. Without further delay, we’re back in business. Regardless of this delayed publication, monitoring for UCMR continued to flow in stride throughout 2001 with many things warranting coverage in this issue. Look for articles covering SDWARS/UCMR, Revised Guidance Documents, Small System Sampling Success, and Preparing for List 2 Chemical Monitoring at Large Systems.

SDWARS/UCMR
Did you hear the GOOD news about that UCMR data system? - On October 1, 2001, the much anticipated and overdue data system known as the Safe Drinking Water Accession and Review System (SDWARS/UCMR) became fully operational. Some of you may have begun to doubt whether the system
would ever be made available for reporting before the end of the monitoring period in 2003. System development complexities initially forced EPA to delay the reporting system from January 2001 until July 1, 2001. Throughout the winter and spring of 2001, development efforts and testing continued. While the system was nearly ready by July 2001, EPA concluded that additional testing was warranted and again delayed the system. By September 2001, things were finally coming together and full system functionality as a production database began on the first of October.

Did you hear the GREAT news about that UCMR data system? - SDWARS/UCMR not only became available in October but laboratories and public water systems (PWSs) have been using the system and IT WORKS!! As of January 25, a total of 1,591 samples have been reported from 30 laboratories. These samples represent 8,525 individual analyte results. In addition, over 1,200 users have registered through Central Data Exchange (CDX) for the system.

**IMPORTANT CLARIFICATION:** Small PWSs (serving <10,000) reporting responsibilities --- You can not register or report through the SDWARS/UCMR system! - EPA will issue you a hard copy report of your UCMR monitoring results and will be issuing a copy of this report concurrently to your state. Upon receipt of these data, review the report and if you have any questions contact the small system UCMR sampling coordination contractor, Great Lakes Environmental Center (GLEC) at 231-941-2230. No further action is required by the small systems for submission of data to U.S. EPA. You should contact your state drinking water administrator to see if they have additional reporting requirements for these data. You should recognize that other regulatory reporting requirements, such as the Public Notification Rule and requirements specific to Consumer Confidence Reports apply. All PWSs (large and small) monitoring for unregulated contaminants, especially those that sampled in 2001 need to remember that Subpart O of the Consumer Confidence Report Rule and Subpart Q of the Public Notification Rule apply to the unregulated contaminants.

What do you need to know about how this SDWARS/UCMR reporting system works? - The process should be simple as long as the responsible individuals at the laboratories and PWSs understand the basic requirements of the electronic reporting system. Data flow through the system is initiated when a laboratory posts and approves their client's data for submission to the PWS. PWSs then approve these results as their official UCMR monitoring report satisfying their regulatory requirement. These approved data can then be concurrently reviewed by EPA and the respective State. PWSs need to know that only they (or someone they designate as their representative) can approve data to be submitted to the U.S. EPA via SDWARS/UCMR.

**I. Initial Steps - What do laboratories and PWSs need to use SDWARS/UCMR?**
Personal Computer (PC) with a 486 processor; a Pentium I or above is recommended.

Microsoft Windows operating system (*Note: Testing indicated newer Macintosh systems are also compatible*): Windows 95B Y2K Service pack installed (Original Equipment Manufacturer Service Release 2); Windows 98; Windows NT3.0 (Service Pack 5); or Windows 2000.

An Internet Service Provider (ISP) or public access to a PC (e.g., local library).

Internet Explorer with the required 128-bit security encryption. This encryption strength provides greater security. It's a free download and comes standard on Internet Explorer 5.5 or higher.

An active account for SDWARS/UCMR through USEPA’s Central Data Exchange (CDX), the agency’s electronic reporting site, which serves as a central point for receiving legally acceptable data in various formats.

**Now you’re asking - What is Central Data Exchange (CDX) and how does it relate to SDWARS/UCMR?**

CDX is the USEPA’s new secure web portal designed to support the exchange of environmental data between USEPA and its external partners. Over the next several years, CDX is expected to expand to become the secure point of entry for most Internet-based, electronic environmental data submissions to the agency. SDWARS/UCMR is the specific database that can only be accessed through the secure CDX portal.

CDX should also improve collection, management, and sharing of environmental information among states, tribes and USEPA so that all entities can achieve their respective and shared environmental goals. Laboratory personnel who must post UCMR data and authorized PWS representatives who will review these data must establish active CDX accounts specifically for entry into SDWARS/UCMR. These individuals, once registered on behalf of the organizations they represent, are able to conduct business in a Web-based system that provides a secure data exchange environment.

**II. Setting up a CDX account**

To set up an account through CDX, log on to the web site at <http://epacdx.lmi.org>, then follow the directions to electronically register with CDX and submit the required
sponsor letter from an official representative of your organization (e.g., Laboratory Director or PWS Chief Administrator) and prepared on corporate letterhead. A sample sponsor letter is available from the web site. Every individual with UCMR reporting responsibilities for your organization must register electronically and be listed, along with their respective CDX user identification and position, in the sponsor letter. Once received and reviewed, qualified users will be notified by e-mail that their account is active.

IMPORTANT: At least one user within your organization (both laboratory and PWS) must have the "Role" of "Approver." Data will not flow through the SDWARS/UCMR system without approval both at the laboratory and PWS level. The available "Roles" depend upon whether you are a laboratory or a PWS.

Laboratory users may identify themselves as either:
1. Reviewer – user that may only view data in SDWARS;
2. Submitter – user that may only post or view data to SDWARS;
3. Approver – user that may view, post and approve data forwarding to PWSs for review.

PWS users may identify themselves as either:
1. Reviewer – user that may only view data in SDWARS
2. Approver – user that may view and approve data to be passed onto EPA review.

SPECIAL REGISTRATION FOR GOVERNMENT USERS

Government users are considered representatives from the EPA, any State, tribe, or territory. These government users have access to review large quantities of data during the regulatory defined 60 day review period but ONLY after PWSs have approved their respective UCMR results. Since this review is restricted to specific individuals within these government organizations, government user registration is unique and requires special clearance. Contact your UCMR EPA Regional representative or Jeffrey Bryan in the Infrastructure Branch for additional details (see contact information at the end of this UCMR Update).

III. Notification via e-mail: You have an active PWS account, now what?

Once a PWS has an active account, qualified staff can enter the SDWARS/UCMR to review the facility and sampling point inventory data for that system to confirm the accuracy of the information. A significant amount of inventory information is also
included in SDWARS/UCMR, much of which may not be directly related to the UCMR monitoring effort. The additional information is to ensure that any special UCMR monitoring circumstances or requirements can be captured and included by the PWS. If your PWS has alphanumeric entries for both facility ID(s) and sampling point ID(s), then it is likely that your state has provided all the information we need regarding sampling locations.

If the sampling location data require editing or systems need to post new UCMR monitoring locations, SDWARS/UCMR can accommodate these corrections or additions, but PWSs are strongly advised to consult with their state drinking water program administrator first. By contacting the state, necessary changes can be made in the state’s inventory records, ensuring consistency between the numbering convention used by the state and that adopted by the PWS.

When laboratories report UCMR monitoring data, they will need to include the exact information regarding the PWS ID (starting with the state postal code), the facility ID number, and the sampling point ID number as it is identified in SDWARS/UCMR.

### IV. Notification via e-mail: You have an active laboratory account, now what?

Laboratories with active accounts need to first consider a few important issues.

- Are your client PWSs registered through CDX for SDWARS/UCMR?
- Have you asked your client PWS, or alternatively, looked at that client's inventory information through SDWARS/UCMR, to verify that the PWS ID, facility ID, and sampling point ID numbers they use to reference their samples are consistent with those listed in SDWARS/UCMR? Laboratories can access the inventory data of PWSs as "read only."
- How will your laboratory choose to enter the UCMR monitoring results into SDWARS/UCMR? A laboratory has three options for submitting UCMR monitoring results. These include submitting the data by hand using Web forms, or through one of two types of electronic file transfers: extensible mark-up language (XML) files or formatted flat files.
  - **Web form** data are entered manually on an Internet form in SDWARS/UCMR.
    - Completing the form electronically is easier than dealing with paper lab slips of
monitoring results, but it can still be time consuming to gather the data and individually enter the data into SDWARS/UCMR Web forms. If you have a lot of data to enter and an automated system for storing it (i.e., a Laboratory Information Management System) you should consider setting up an XML or flat file submission instead.

- **XML files** are based upon a document type definition (DTD) that defines the rules the XML document must follow to be valid according to the *UCMR Reporting Implementation Guidance*, (see details below) Volume IV. In order to generate an XML document, the laboratory will need to use a validating XML parser (a computer program that breaks down text into recognized strings of characters for further analysis) to map the extracted data with the DTD. Commercial XML parsers are available in a variety of packages that range in capabilities and prices. Because of the complexity of implementing XML, an organization should possess qualified information technology staff, sufficient electronic traffic, and a substantial environmental reporting obligation. Regardless of the nature of the obligation, it must be sufficient enough that the organization is willing to invest resources in collecting and managing environmental data.

- **Flat files** are created by preparing an extraction of data from the Laboratory Information Management System (LIMS). LIMSs may be programmed to extract and parse the flat file elements or may use some data transformation software to parse the data once it is extracted. When architecture for extracting the data has been determined, the data must be parsed into a flat file format. USEPA will maintain the most recent UCMR flat file format documentation on the UCMR reporting Web site in *UCMR Reporting Implementation Guidance*, (see details below) Volume V. The laboratory should validate the resultant flat file to confirm that it complies with the required format. Because flat files are similar to XML, but less complex, organizations considering submitting data by flat file should possess attributes similar to those related to XML submission.

If you are submitting a large volume of files regularly, creating the electronic submission file and maintaining the file format may be worth the time and effort. On
the other hand, if your organization only submits a couple records a month, entering
the data in the Web form may be more efficient.

**SDWARS/UCMR Implementation Guides**

The following Implementation Guides (IGs) are specific to various SDWARS/UCMR
activities. These are available for electronic download off the internet at:
<http://epacdx.lmi.org/FAQ.asp>
Alternatively, copies of these can be requested from the CDX SDWARS/UCMR Help

- **IG Volume I (EPA 816-R-01-022A)**
  —Introduces the CDX and electronic reporting.
- **IG Volume II (EPA 816-R-01-022B)**
  —Contains details about using web forms to submit, review and approve data for the
  UCMR.
- **IG Volume IV (EPA 816-R-01-022C)**
  —Documents in detail the formatting requirements for Extensible Markup Language
  (XML) to be used with the EPA-provided document type definition (DTD) to
  create a well-formed, valid XML document.
- **IG Volume V (EPA 816-R-01-022D)**
  —Documents in detail the formatting requirements for a delimited flat file.

**2001 UCMR Monitoring Data - Deadlines for Reporting**

U.S. EPA is amending the UCMR regulatory language (as published in the January
11, 2001 and September 4, 2001, *Federal Register*) to specify when UCMR monitoring
data will need to be reported. Draft Rule language, which is expected to be published
soon, has been prepared specifying a deadline of 150 days from the publication of the
Rule in the Federal Register. It will apply to all data received within 60 days of
publication of the Rule in the Federal Register.

**Recently Released Guidance Documents**

Several guidance documents have recently been prepared and are now available from the
UCMR web site <www.epa.gov/safewater/ucmr.html>. These include:

- **Unregulated Contaminant Monitoring Regulation Reporting Guidance**
  (EPA 815-R-01-029, November 2001)
A guide which can be used to explain the UCMR reporting process.

**Reference Guide for the Unregulated Contaminant Monitoring Regulation**
(EPA 815-R-01-023, October 2001)
- If you choose to only read one guidance manual, choose this document. This guidance manual is meant to generally cover all major aspect of the UCMR and provides valuable reference information as a single integrated document.

**UCMR(1999) List 1 and List 2 Chemical Analytical Methods Quality Control Manual**
(EPA-815-R-01-028, December 2001)
- A necessity for any laboratory supporting UCMR monitoring capturing all the required QC criteria from the various approved methods. This manual replaces all of the previous Analytical Methods and Quality Control Manuals and their supplements and includes both the List 1 and List 2 chemical monitoring methods.

**Frequently asked Questions about the Unregulated Contaminant Monitoring Rule**
(1999)
- This guidance document provides answers for many of the questions that have been presented to the UCMR implementation team during regulatory development and the first year (2001) of UCMR implementation. Some of these issues may not always be specifically or clearly addressed in the Preamble, Rule or other implementation guidance materials.

**Small System Sampling**
UCMR monitoring at selected small systems (those serving less than 10,000) went very well during 2001. Much of this credit goes to the UCMR partnered states that are assisting us with implementation and the selected small systems for their responsiveness and continued cooperation. This first group of systems, which were sampled in 2001, contained 283 of the 800 selected small systems. If you were one of those systems which was sampled in 2001 and you are not an Index System, your sampling has been completed. If you have yet to be sampled, expect to hear from the UCMR small system coordination contractor, GLEC sometime over the next two years. Of the monitoring events scheduled to be completed through October, 99.1% of them have been reported back to the PWSs and states.
Screening Survey for List 2, Chemical Contaminants - Small system sampling efforts for List 2 chemical contaminants were completed (other than a few remaining re-sampling issues) in 2001 and now the large systems selected for this monitoring need to be prepared in 2002. Three EPA methods are approved to complete this monitoring, namely 526, 528 and 532. Laboratories certified to conduct EPA Method 525.2 are approved to use EPA Methods 526 and 528. Laboratories certified in either 549.1 or 549.2 are approved to use EPA Method 532. While any laboratory with these certifications can analyze List 2 chemical monitoring samples, EPA has contracted with Environmental Health Laboratories and Montgomery Watson Laboratories to complete these sample analyses for our small systems. EPA is not wishing to promote these commercial contract laboratories, but they have been identified since we have been asked from PWSs about which laboratories we know are supporting these analyses. PWSs should contact their normal commercial laboratory and inquire. Either of these identified labs, as well as many others with the prerequisite certifications will likely be able to provide a price quote for supporting these analysis.

List 2 Microbiological Monitoring - 2003

Aeromonas- The microbiological contaminant Aeromonas is part of the Screening Survey for List 2, and will begin being monitored by selected Public Water Systems in the early months of 2003. While the Screening Survey for List 2 chemical contaminants were monitored in 2001 at the selected small systems and will be monitored in 2002 at selected large systems, Aeromonas monitoring is scheduled to begin in 2003. The method that will soon be proposed for List 2 monitoring of Aeromonas is EPA Method 1605. Method 1605 is a membrane filtration method in which a modified medium will be used. This medium is Ampicillin-Dextrin Agar (ADA) which will be modified by adding Vancomycin. Vancomycin prevents the formation of gram positive bacteria and, along with three confirmation steps specified in Method 1605, will aid in identifying Aeromonas to the genus level. Approval to conduct Aeromonas monitoring using Method 1605 will be based on the following:

- State or primacy agency certification to perform an approved membrane filtration method for compliance monitoring of coliform indicator bacteria.
- Successful analysis of a set of performance testing samples provided by EPA. Passing the Performance Test indicates that a laboratory is capable of correctly using the Aeromonas method.

Laboratories wishing to participate in the Aeromonas PT program and be approved must submit a “request to participate” letter to the U.S. EPA. The U.S. EPA has established 45 days following the publication of the rule as the latest date by which it will accept the “request to participate” letter. A second PT study will only be conducted if more than 90 days remain between the reporting of the results of the first study and the beginning of Aeromonas monitoring, January 2003. After completion, U.S. EPA will provide each successful laboratory with an approval letter identifying the laboratory name and
approval date. This letter along with the evidence of certification for analysis of coliforms by an approved membrane filtration procedure provides evidence to a PWS that the lab is approved for *Aeromonas* under the UCMR.

**Resources for additional information**

U.S. EPA has several Web sites dedicated to UCMR and specific to the reporting process. These web sites are continuously updated with the latest information.

- OGWDW UCMR main page: <www.epa.gov/safewater/ucmr.html>.
- CDX home page: <www.epa.gov/cdx>
- CDX registration page: <http://epacdx.lmi.org>

Looking for someone to talk directly?

- Safe Drinking Water Hotline: 1-800-426-7491
- CDX Help Desk for database issues related to SDWARS/UCMR: 1-888-890-1995

**U.S. EPA Contacts:**

- Region 1: Chris Ryan, (617) 918-1567
- Region 2: Robert Poon, (212) 637-3821
- Region 3: Michelle Hoover, (215) 814-5258
- Region 4: Janine Morris, (404) 562-9480
- Region 5: Janet Kuefler, (312) 886-0123
- Region 6: Andrew J. Waite, (214) 665-7332
- Region 7: Stan Calow, (913) 551-7410
- Region 8: Rod Glebe, (303) 312-6627
- Region 9: Jill Korte, (415) 972-3562
- Region 10: Gene Taylor, (206) 553-1389
- Technical Support Center-**UCMR Implementation issues**: Dan Hautman, (513) 569-7274
- Infrastructure Branch - **SDWARS/UCMR database issues**: Jeffrey Bryan, (202) 564-3942
Appendix B

The UCMR Update Issues Edited by the Author
UMCR Update Issue Number 4 - This information sheet, The UCMR Update, is the fourth to be issued by the Technical Support Center (TSC) of the Office of Ground Water and Drinking Water (OGWDW). Future issues will be distributed as needed to maintain information flow related to the Unregulated Contaminant Monitoring Regulation (UCMR for those of you who may have forgotten).

Editor’s Note: As summer turns to fall, the Earth enters a time of renewal. It is marked by the passing of the old in the fall with the hope of the new, come springtime. The Update staff is also entering a renewal period as the former editor, Rayshawn Askew, has left to pursue a career in the National Football League. You may remember that Jim Walasek, the editor prior to Rayshawn, entered the greener pastures of retirement a year ago. This revolving door of editors at The Update has inspired the phrase “Another issue, another editor” among the staff.

The task of editing The Update has now passed to me, Cory Wagner. I am an Oak Ridge Intern Fellow with TSC and the newest member of the UCMR Implementation Team. I hope to provide the same level of journalistic integrity while simultaneously delivering some plain-English insight into key aspects of the regulation, thus simplifying the UCMR. Expect the same high quality, highly technical information that you have come to rely on as well as the biting wit that you have come to love. This issue features information on the following:

- **Aeromonas**: the proposed rule, lab approval program, sampling, and the reporting of data
- Large systems: assessment monitoring letters and List 2 phone calls
- Laboratory testing involving perchlorate, nitrobenzene, and the reporting of analyzed samples
- The first posting of UCMR data
Aeromonas, Aeromonas

First of all, this section does not apply to everyone receiving this newsletter. There are 120 large systems and 180 small systems that are required to sample for the microbial agent, Aeromonas. Required public water systems (PWS’s) should have received notification from either EPA or their state/tribe/or territory primacy agency. If you are not one of those 300 selected systems, you may want to skip down to the section marked “Large Systems.” That is unless you’re really crazy about Aeromonas, in which case, I encourage you to read on. For those of you who are unsure about whether you are required to sample for Aeromonas, the following URL has a list of both large and small systems that have been selected to participate:

http://www.epa.gov/safewater/standard/ucmr/systems.html

As a side note, it may be interesting to some of you to know exactly what it is that you are sampling for. For those of you who may not know, Aeromonas spp. are a group of bacteria that are found in fresh and brackish water environments. There are many species in the group and some are known to cause illness in fish and amphibians. In humans, Aeromonas has been implicated as a possible cause of some types of diarrhea and gastroenteritis. For more information, see the following URL:

http://vm.cfsan.fda.gov/~mow/chap17.html

The Proposed Aeromonas Method Rule

On March 7, 2002, EPA published a proposed rule to approve EPA Method 1605 for the monitoring of the List 2 microbial contaminant, Aeromonas. This proposed rule, entitled Unregulated Contaminant Monitoring Regulation: Approval of Analytical Method for Aeromonas; National Primary and Secondary Drinking Water Regulations: Approval of Analytical Methods for Chemical and Microbiological Contaminants (Try saying that three times fast!), was open for comment until May 6, 2002. The portion of the proposed rule that pertains to UCMR essentially defines the analytical method (EPA Method 1605: Aeromonas in Finished Water by Membrane Filtration using Ampicillin-Dextrin Agar with Vancomycin (ADA-V) (EPA-821-R-01-034, October 2001)) for the detection of Aeromonas and sets a minimum reporting level (MRL) for the PWSs that will be testing for the bacteria in 2003. While it does not apply to the UCMR, the proposed rule also establishes several new analytical methods to support National Primary Drinking Water Regulation (NPDWR) compliance monitoring. The “Aeromonas Rule” is expected to be promulgated in the fall of 2002. The text of the proposed rule can be found at the following URL (although we strongly suggest that you don’t operate heavy machinery while reading it):

http://www.epa.gov/safewater/standard/ucmr/aeromonas.htm

But wait…..there’s more

The Aeromonas PT Program

In addition to the above, the preamble to the proposed Aeromonas Rule also described the Aeromonas Performance Testing (PT) program for laboratory approval. A laboratory must have advance EPA approval to support Aeromonas monitoring. Interested laboratories may participate in this voluntary PT program before the final rule
is promulgated. A laboratory must:

1. Submit a letter of request to participate,
2. Submit its Initial Demonstration of Capability (IDC) data,
3. Provide proof of certification for a membrane filtration method, and
4. Successfully pass the Performance Test.

Once this is done, a laboratory will receive a letter indicating that its approval to perform *Aeromonas* analyses for the UCMR is pending. Final laboratory approval letters will be issued after the final rule is promulgated. Laboratory approval will be limited and specific to the duration of *Aeromonas* monitoring under the current UCMR cycle. This monitoring is scheduled to begin in January 2003. At the time of this publication, one PT study has already been concluded and a second is underway. So far, four laboratories have passed. As more labs pass the PT studies, they will be added to the Web site, which can be found at the following URL:

http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html

In addition, one more PT study is planned for later this year. Interested laboratories can see the application procedure at the following URL:

http://www.epa.gov/safewater/standard/ucmr/aeromonas_pt.htm

### Aeromonas Sampling and the MRS

*Aeromonas* monitoring review sheets (MRS) were designed to solicit information regarding sample point location, sample point I.D. and sampling time for *Aeromonas* from each selected PWS. They are also used to provide contact information for the PWS to EPA. In some cases, these forms have already been completed by state/territory/tribal primacy agents for the PWS. These PWSs will receive a completed form for review and the primacy agent will be conducting the *Aeromonas* sampling for the PWS.

For those of you whose state/territory/tribe did not complete the form, we’ll be counting on you to do so. Selected systems should have already received a form to be completed. These forms were mailed, along with “notification” letters, on July 24. Please review your form and return completed forms, as applicable, to TSC by the deadline of September 1, 2002.

If you are on the list of affected systems (see above) and have not received either a notification letter and MRS, or, alternatively, notification from your state/territory/tribal agency that they will be sampling for you, please contact the UCMR Coordinator at the TSC (address listed near end of *The Update*).

### LARGE Systems News

If you are a public water system (PWS) and serve over 10,000 people, then this section is for you:

### Assessment Monitoring Reminder Letters
TSC will be sending out reminder letters to all large PWSs that have not posted any assessment monitoring (List 1) data to the Web-based reporting system, the Safe Drinking Water Accession and Review System (SDWARS/UCMR), as of August 2002. As you know, next year marks the final year in this UCMR monitoring period and all sampling must be done by the end of 2003. The letters are expected to be mailed in September 2002.

Screening Survey Reminder Calls
The Great Lakes Environmental Center, affectionately known as GLEC, is a contractor supporting data follow up for EPA. They will be calling any large PWS that is required to sample for List 2 items (and you should know who you are). Those sampling for List 2 chemicals will receive a call from GLEC if you have yet to post any data to SDWARS/UCMR. This monitoring was to have occurred in 2002. For those sampling for List 2 Aeromonas, GLEC will call you if you have not returned the MRS by the September 1 deadline.

Random Musings

The following topics are applicable to all UCMR Update readers.

Some Percolating Thoughts About Perchlorate
Please note that the list of approved laboratories that may analyze UCMR samples for perchlorate has been posted on the EPA Web site. The URL is: http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html

For all you large PWSs out there, make sure that you are using an approved lab for the perchlorate analysis. The laboratory MUST be approved and use EPA Method 314.0. This is extremely important, as the data can not be used if generated by a lab that is not approved. This will require you to resample and will cause a delay in the progress that you have achieved thus far.

Laboratories Reporting Data:

EPA would like to clarify that the laboratory that actually performs any analysis for UCMR must be the one to post the data to SDWARS/UCMR. If you have any questions regarding this, please contact the UCMR Coordinator (address near the end of The Update).

Nitrobenzene and the (mis) use of EPA Method 526
Attention all labs and PWSs: if you are performing assessment monitoring (List 1) for nitrobenzene and using EPA method 526, PLEASE STOP!! EPA Method 526 is ONLY approved for nitrobenzene as a List 2 contaminant. It cannot be used for assessment monitoring. Large PWSs are responsible for ensuring that their nitrobenzene
testing is being performed properly, using any the following methods: EPA 524.2, ASTM D5790, SM 6210D, or SM 6200B.

Extra, Extra! Data Posted on Web!! Read All About It!!

Finally, after much hair-pulling and hard work, the first batch of approved UCMR data has been posted to the Web!!! We here at The Update are very excited to see the fruition of all the hard work from dedicated individuals within our extended UCMR partnership team, PWSs and supporting analytical laboratories. These combined efforts have enabled us to achieve this important milestone. We hope you share in our excitement. Look for more data to be posted in the future. The link to posted data is: http://www.epa.gov/safewater/data/ucmrgetdata.html

Important Dates

September 1, 2002:
- Deadline to return Aeromonas monitoring review sheets (MRS).

September 30, 2002:
- Reminder letters issued to all large PWSs that have not posted any assessment monitoring data to SDWARS.

October 10, 2002:
- Determination and posting of laboratories approved for Aeromonas testing based on the second round of PT testing.

October/November:
- “Aeromonas Rule” expected to be promulgated
- Deadline for submitting Aeromonas PT letter of request to participate for the third and final round of laboratory PT Testing, based on time of publication of the rule.

January 1, 2003:
- Beginning of the final year of assessment monitoring under the current UCMR cycle.
- Beginning of first Aeromonas sampling period.

Contact Information:

A general reminder to laboratories and PWSs: when contacting the EPA about UCMR issues, please use you USEPA Lab ID number or PWSID number respectively.

General UCMR questions may be directed to the Drinking Water Hotline at:

1-800-426-4791

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Questions regarding registration for or use of the SDWARS/UCMR reporting system may be directed to the SDWARS Help Desk at:

1-888-890-1995

Correspondence with TSC may be directed to:

**UCMR Coordinator**
Technical Support Center (MS-140)
U.S. Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, OH 45268
FAX: 513-569-7191

**Future Issues of the UCMR Update**

This issue of **The UCMR Update** is sent to you to keep you abreast of the latest information on the UCMR. If you know of someone else not currently on the **Update** mailing list, who would like to receive future issues, please have them fill out the form below and return it to TSC. You may also e-mail me a short message with your mailing address at **wagner.cory@epa.gov** to be placed on the mailing list. Previous issues may be viewed online at: [http://www.epa.gov/safewater/standard/ucmr/updateindex.html](http://www.epa.gov/safewater/standard/ucmr/updateindex.html)

Thank you.

Yes, I would like to receive future issues of **The UCMR Update**. My current mailing address is:

Name: __________________________________________________

PWSID#(or USEPA Lab ID#):____________________________________

PWS (or LAB) Name:___________________________________________

Mailing Address:_____________________________________________

___________________________________________________________

City:_________________________________________________________

State:__________________ Zip: ________________________________

Would you like to receive **The Update** via Email?________

Email Address:______________________________________________

Mail to Cory Wagner, Technical Support Center (MS-140), U.S. EPA, 26 W. Martin Luther King Dr., Cincinnati, OH 45268
TSC hopes that you had a Happy Thanksgiving and that your turkeys were flavorful, your time with family was enjoyable, and your couch was soft for the after dinner nap.

**UMCR Update Issue Number 5** - This information sheet, *The UCMR Update*, is the fifth to be issued by the Technical Support Center (TSC) of the Office of Ground Water and Drinking Water (OGWDW). Future issues will be distributed as needed to maintain information flow related to the Unregulated Contaminant Monitoring Regulation (UCMR for those of you who may have forgotten).

**Editor’s Note:** As you all know, the past month featured the Thanksgiving holiday. Before we rush head on into the end-of-year holidays, EPA would like to reflect on the holiday that just occurred. In addition to eating turkey, watching football, and falling asleep on the couch, this holiday is a time to give thanks for the people that have played important roles in one’s life. In the spirit of Thanksgiving, EPA would like to offer thanks to all the water systems, laboratories, state employees, and contractors who have played an integral role in the implementation of the UCMR. This is truly a co-operative effort and a large undertaking that could not be accomplished without the help of all the dedicated people out there. EPA has enjoyed working with all of you thus far and hopes to continue that excellent co-operation as we head into the homestretch of this UCMR cycle. Again, thank you all. Now, the fun. This issue features information on the following:

1. The EPA Reminder Letter for List 1 monitoring requirements
2. SDWARS quirks and contact information
3. The *Aeromonas* Reporting Approach

**I. The Great Reminder Letter Misunderstanding of 2002**

During late September/early October, many PWSs received letters from EPA reminding them of their Assessment Monitoring (List 1) requirements under the UCMR. These letters were sent to all systems that did not appear to have reported any data to the Safe Drinking Water Accession and Review System (SDWARS), as of September 6th. This letter seems to have inspired more anger, fear, and confusion than any event since Orson Welles read *War of the Worlds* over the radio. As in the Welles instance, the reality of this situation was very much misinterpreted. This was only a REMINDER letter. It was not a VIOLATION letter. No one has been fined and no one is going to jail (except for maybe me if I don’t pay that parking ticket). It was meant to prevent any PWSs from being out of compliance at the end of 2003 by reminding them that they had yet to submit any data to SDWARS. EPA apologizes to anyone who misunderstood the
intent of the letter. As a rule, EPA would much rather help people be in compliance with regulations than pursue them with fines and other punishments.

Now, I know some of you are out there may be saying “(Fill in a suitable swear word here), I sent my sample to the lab and they’ve already posted the results for me!” While it may be true that your lab has posted your results, they cannot officially report UCMR data, unless they are designated as a PWS representative. EPA wants to remind you that the PWS must review and approve data posted by a lab, unless written consent has been given to the lab to officially act on behalf of the PWS and approve data. This requires a PWS sponsor letter, signed by the PWS official representative, specifying an individual lab by their Central Data Exchange (CDX) User I.D. as the approving official for the PWS. EPA cannot use any data in SDWARS until it has been approved by the PWS.

In closing then, EPA apologizes for any confusion and looks forward to continuing the strong co-operative working relationship that has thus far been displayed throughout this UCMR cycle.

II. Disappearing Data

Some PWSs have complained that their data have seemed to vanish, simply disappearing from SDWARS faster than the retirement savings in my IRA. Don’t worry! While not lost, the data can disappear from a PWS’s view after a period of time. This occurs when a state enters SDWARS and marks the data received. I know that some PWSs have expressed concerns that when they go to look for old data that they know had been posted and approved, it is no longer visible. If you have record of previously approving results, you can rest assured that the data have been stored in the database. You may wonder, “Why was this system set up this way?” SDWARS was developed as a temporary reporting system used to “access and review” monitoring results, not to permanently store all the information. These data will be stored as a separate, final database set and will be publicly accessible through the Internet. In addition, concerns over the volume of data some users would continually “view” when conducting a search prompted EPA to establish this type of system. However, to document your approval of these data, EPA recommends that you print your results, using your browser print function, after you have designated them as “approved”. To do this, repeat the same search used to generate the data table that included results with a status of “PWS Hold” which have just been approved, and print that table. You will notice immediately after you have approved data and repeat the search, you no longer have access to the “Status” field, since they are now approved for final submission to EPA and the State, but you can still view these results. Print this and keep this with your official compliance records for UCMR. Following EPA and State review, these results will be posted publicly on the Web at: www.epa.gov/safewater/data/ucmrgetdata.html.

Who you Gonna Call?

If there’s something wrong…with CDX or SDWARS. Who ya gonna call? Ghostbusters? Well, maybe that’s not such a bad idea, with data disappearing like Slimer through a wall. All SDWARS related questions should be directed to the SDWARS Help Desk (1-888-890-1995). If the Help Desk is not able to address all your
concerns, please contact the Infrastructure Branch (IB), the group responsible for SDWARS oversight. The contact person is Roger Howard at (202) 564-9907.

III. Aeromonas Systems

The following section applies only to those systems that have been selected to participate in List 2b-Aeromonas monitoring. The rest of you may skip to Section 4, unless you really can’t get enough of the Update. In that case, read on!

Aeromonas Rule(s)!!

The long awaited Aeromonas Rule has been signed and published. It is now available and should keep the appetite sated of those who waited in anticipation for a new piece of environmental legislation to chew on. The EPA Administrator signed the rule on October 18, 2002. This news may elicit yawns from some, but trust me, this is BIG! First of all, it means that EPA Method 1605 has been officially approved for the measurement of Aeromonas. It also kicks off the beginning of a final Aeromonas Proficiency Test (PT) study. As you may recall from the last issue, any laboratory that wants to participate in the analysis of Aeromonas samples for the UCMR must pass an EPA PT for Method 1605 (http://www.epa.gov/safewater/standard/ucmr/aeromonas_pt.htm). Remember, only large PWSs selected for Aeromonas monitoring are required to establish analytical contract support for this monitoring from an EPA approved Aeromonas laboratory. If your system is depending on a regularly contracted laboratory to pass this last PT, please be aware that approximately 50% of labs have failed on their first attempt to pass a PT study. As there will be no further PT’s administered after December 2002 we suggest that you have a backup plan in the event that the lab that you intend to contract with does not pass. A list of laboratories that have already been approved for Aeromonas testing under the UCMR is available on the Web at (http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html).

Aeromonas Reporting Approach

Large Systems

On November 1st, EPA sent out data collection sheets to all large PWSs that are required to sample for Aeromonas. These arrived in the form of e-mails to those systems for which EPA has an e-mail address, and by U.S. mail to those systems that have not established an e-mail address with EPA. Please note that you WILL NOT be reporting Aeromonas results electronically via SDWARS. The system was not designed to handle Aeromonas data. Besides, we didn’t want to infect SDWARS with “bugs” anyway.

The e-mail (and U.S. mail for that matter) that PWSs received should contain 9 attachments: An Aeromonas reporting standard operating procedure (SOP), a reporting Technical Assistance (TA), an Aeromonas Fact Sheet, and six Microsoft Excel™ spreadsheets corresponding to each month in which the PWS is scheduled to sample. Please make sure that you received the correct data reporting sheets for your PWS. If you have not responded to EPA that you have received the e-mail, please do so as we are tracking the responses to make sure that all sheets were received.
Now for a few notes on how this system is going to work. First of all, in the month prior to your scheduled sampling month, you should receive an e-mail (or letter) reminding you that you are approaching your month to sample for Aeromonas. It will also contain the data collection sheet for that month (in case you lost it, your computer crashed, a dog ate it, or you used it to line the bottom of the bird cage). You will then sample at the three locations that you designated as the midpoint, lowest disinfectant residual, and maximum residence time points in your distribution system. Please note that all water quality parameter measurements (temperature, pH, free chlorine and total chlorine) must be made in the field, with the single exception of turbidity. Turbidity can be measured in the field or in the lab, within 48 hours of collection. All measurements must be taken by using approved methods as per the SOP and TA sheet. You will then fill out the relevant portion of the spreadsheet.

The samples will then be sent to an EPA-approved Aeromonas lab along with the data collection sheet. The samples must remain cold (1°C to 10°C) and need to be sent overnight to the laboratory. Any collected sample must be processed using EPA Method 1605 within 30 hours of the collection time. The lab will test the samples for Aeromonas, fill out the relevant portion of the data sheet, and send it back to the PWS for review, approval and final submission to EPA. The next sampling month, you should receive another e-mail (or letter) and the process will repeat itself.

Any system that is currently receiving regular mail notices and would like to receive e-mail notices can contact Cory Wagner at (513) 569-7932.

Small Systems

It's a slightly different ball game for you guys. EPA has contracted with the Great Lakes Environmental Center (GLEC) to assist you with the Aeromonas sampling efforts. EPA has also contracted labs that will be performing the analysis for you and reporting the results to EPA.

In December 2002, a step-by-step video of the sampling process will be sent to small PWSs. (I’ll bet you can’t wait to throw some popcorn in the microwave for that one! What’s better than chestnuts roasting on the open fire, Jack Frost nipping at your nose, and a good old-fashioned sampling video?) Then, in the first month in which you are to sample, you will receive a kit from GLEC with instructions to assist you. This will include sample bottles, U-TEK™ freeze packs and a comprehensive water quality monitoring tool kit (including a nifty hand-held colorimeter to measure free and total chlorine, a pH probe, and a thermometer), a cooler to transport the packs and samples, completed FedEx airbills to the laboratory and sampling instructions. The cooler and water quality parameter kit are yours for the duration of the Aeromonas sampling. Please don’t lose it or break them. At the end of the sampling period, EPA will be asking for you to return the cooler and kit. (The video is yours to keep in the event that you become nostalgic for the old UCMR Cycle 1 days. Good times, good times.)

The video and instructions will help you to sample and collect the water quality parameters. Should you still have concerns, GLEC can provide on-site support for the first sample month to assist you. This on-site support is a one-time deal though. The next sample month, you will receive a sample kit only, and be expected to proceed from there. Piece of cake!
States, Regions, and Laboratories Participating in Aeromonas Monitoring

The participating states, EPA regional offices, and Aeromonas laboratories should also have received an e-mail or a letter containing the SOP, the TA, and a sample data collection sheet that represents what the water systems received. This was done to assist those states that are sampling for their affected water systems and to keep all parties in the loop. Any assistance you can provide the water systems, especially the small systems, will be much appreciated.

IV. Important Dates

January 1, 2003:
- Beginning of the final year of Assessment Monitoring under the current UCMR cycle.
- First sample month for Option 1 Large and Small Aeromonas systems.

February 1, 2003:
- First sample month for Option 2 Large and Small Aeromonas systems.

March 1, 2003:
- First sample month for Option 3 Large and Small Aeromonas systems.

V. Contact Information:

A general reminder to laboratories and PWSs: when contacting EPA about UCMR issues, please use your USEPA Lab ID number or PWSID number, respectively.

General UCMR questions may be directed to the Drinking Water Hotline at:

1-800-426-4791

Questions regarding registration for or use of the SDWARS/UCMR reporting system may be directed to the SDWARS Help Desk at:

1-888-890-1995

Correspondence with TSC may be directed to:

UCMR Coordinator
Technical Support Center (MS-140)
U.S. Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, OH 45268
Fax: 513-569-7191
UMCR Update Issue Number 6- This information sheet, The UCMR Update, is the sixth to be issued by the Technical Support Center (TSC) of the Office of Ground Water and Drinking Water (OGWDW). Future issues will be distributed as needed to maintain information flow related to the Unregulated Contaminant Monitoring Regulation (UCMR for those of you who may have forgotten).

Editor’s Note: March is gone but not forgotten, as I am still thawing from the icy weather here in Ohio. By June, I might actually feel warm again. However, here is a thought that will add warmth to anyone. With the changing of the calendar year, there is now a light at the end of the tunnel. The cynical among you might say it’s a train, but I digress. In any case, 2003 is the FINAL year of monitoring for the current cycle of UCMR! That’s right, F-I-N-A-L. Look at how far we have come in the past three years. We are in the home stretch now and it should be easy sailing from here on out.

As an aside, I have to give out a coveted “UCMR Update Lifetime Achievement Award” to….me! You probably have not noticed, but with this issue, I have gone where no previous UCMR Update editor has gone. I have served as editor of the Update for three, count them, consecutive issues. The previous record, held by Jim Walasek, was two. Having boldly crossed the three-issue barrier, I now seek to go on and publish four, maybe even five, more of these newsletters. That is of course, unless they decide to haul me out of here kicking and screaming first. Now, on with the info.

I. Final Year of Monitoring: Facts, Figures, and Statistics

As it is officially the “Final Year of Sampling” in this cycle of the UCMR, TSC thought it would be interesting to see where we all are in this process thus far. To those of you who are into number crunching, feast on this. As for me, I detest simply posting stats, but here is where we stand as of right now:
• Screening Survey for Small System List 2 Chemical: 100% Complete!!!
• Screening Survey for Large System List 2 Chemical: 42.8% Complete (77 of 180)
• Assessment Monitoring for Small Systems: 65.3% Complete (522 out of 800).
• Assessment Monitoring for Large Systems: 1378 (and counting) systems have reported data to the Safe Drinking Water Accession and Review System.

TSC is exceedingly pleased with the participation thus far. Keep it up! Please note that this is the LAST YEAR for PWSs to conduct their List 1 assessment monitoring responsibilities. This was the subject of the previous, and now infamous, reminder letter that sent in November 2002. The Magic 8-Ball® on my desk indicates that there could be another reminder letter or calls at some point in the future with the message “Outcome Likely”. However, this same oracle has told me on numerous occasions that my lottery numbers were going to hit, and I haven’t seen a penny yet. Please remember that this letter or call, should it come, will only serve as a reminder of UCMR sampling duties to those that have yet to report List 1 Assessment Monitoring data to SDWARS.

II. The First Semi-biannual “UCMR Golden Faucet” Award

The Golden Faucet Award, or simply the Faucy, was established last week when we here at TSC realized that we needed an instrument with which to reward those who went above and beyond in performing duties related to the UCMR. The award was established to honor “individuals, groups, PWSs, laboratories, States, and/or EPA Regions who exhibit extraordinary efforts supporting the implementation of the Unregulated Contaminant Monitoring Regulation”. This issue’s Faucy goes to Robert Poon of EPA Region 2 for his tireless efforts in following up with PWSs in the region that had not yet reported any data to SDWARS. Many of these systems had had difficulty in working with SDWARS and Robert was able to effectively help them resolve these issues. It is effort like this that helps everyone accomplish his or her respective responsibilities within the UCMR. We here at TSC appreciate Robert’s hard work, as it is often impossible for us to follow up with each and every system participating in the UCMR.

For his efforts, Robert would have received an actual golden faucet. However, security is watching the bathroom way too closely and I have no gold paint. As a compromise, he will be receiving an official commemorative certificate from TSC. In all seriousness, we here at TSC do like to acknowledge hard work in support of the UCMR. It makes the whole process go more smoothly. Anyone who would like to nominate a recipient for the Faucy award should feel free to contact me at wagner.cory@epa.gov.

III. UCMR Forum

As it is the final year of this cycle of UCMR, TSC would like to gather some information and opinions about how this cycle of UCMR has gone for everyone who has been involved. This is your chance to tell us what you liked, disliked, and felt could be improved about all aspects of the UCMR implementation. Liked SDWARS but felt the Aeromonas reporting system was a pain in the donkey? Let us know! Were the instructions, technical assistance, and FAQs helpful or did they make you want to pull out your hair? Tell us about it! You are all very valuable stakeholders in this process and in
the development of the next cycle of the UCMR. We will attempt to post some of the most insightful comments and give an overall consensus of the opinions in the next UCMR Update. Please use the form at the end of the Update to submit your comments.

IV. UCMR Data

Yes, there are some! Actually, there are quite a lot. A new batch of data has been posted for public viewing at http://www.epa.gov/safewater/data/ucmrgedata.html. EPA is posting data on a quarterly basis. Now, you may go to the website and say “Hey, where’s my data? I reported it, why isn’t it here?” An excellent question, I must say. The answer is that it was likely held back by our data QC review system. Why? Well, there are several reasons data may be held for review.

- Duplication. If a sample ID is duplicated at different facilities within a PWS or if a record is entered twice, the data are held back. Believe me, once is plenty for EPA.
- Accuracy results below 2%.
- Perchlorate results reported from a laboratory that is not approved by EPA. Please make sure your lab is APPROVED to test for Perchlorate.
- Reporting List 2 data to SDWARS using methods from List 1 or reporting List 2 data when a PWS was not assigned to monitor for List 2 contaminants. TSC does appreciate the extra mile, but we certainly don’t want anyone to be sampling anything they aren’t required to.
- Extraction/analysis date before sample collection date. Unless you can prove possession of a time machine, I don’t think this is possible.
- Sample point delineation issues. In SDWARS, sample points associated with List 1 and List 2 Chemical monitoring should only be designated as either entry point (EP) or source water (SR). TSC is aware that SDWARS includes other options, but they aren’t valid for List 1 or 2 chemical monitoring. Please do not select them. Midpoint (MD), Lowest Disinfectant Residual (LD), and Maximum Residence (MR) were developed for Aeromonas sampling (which is not being reported via SDWARS). Unknown (UK) should not be used, as TSC will have to call you later and find out if the sample point is a SR or EP. Furthermore, laboratories should only assign sample analysis type “raw field sample (rfs)” or “raw duplicate sample (rds)” to SR sample points. In contrast, sample analysis type “treated field sample (tfs)” or “treated duplicate sample (tds)” should only be assigned to EP sample point types, with the exception of a system that uses no water treatment.

If your data are not posted, please review them and see if they fall under one of the above categories. Also, please keep the above rules in mind when posting data in the future.

V. Aeromonas Updates

As stated in past issues, the following section will only apply to those systems selected to participate in the List 2 Screening Survey for the microbiological contaminant Aeromonas.
The first set of data sheets from the PWSs that sampled in January have begun to come in. For those of you that have sent them in already, great job! We look forward to receiving the data sheets from the rest of the water systems soon. Anyone who has questions about the reporting system can send an email to CI TSC-Micro@epa.gov.

Recently, the question has been raised as to whether a system that is supposed to sample in a given month is required to submit data in that month as well. The answer is no. TSC requests that you send your data sheets in as soon as you can but it is not required that it be the same month as you sampled. A general rule of thumb would be to try to submit your data sheet within the month after you sampled.

One thing that TSC has noticed on the data sheets is that some of you have not filled in the approval date and method fields. The approval date is the date that you review the results from the lab and decide that they are fit for submittal to EPA. The method is simply the method used to obtain the water quality parameters. Please fill these in, as they will save EPA and you a phone call in the future.

TSC would also like to request that you use the data sheets that were sent to you for the month in which you were supposed to sample. Please do not make your own sheet, or adapt a template that you may have come across via your Aeromonas Laboratory. If you do not have your sheets, TSC will be happy to resend them. The reason for this is that the sheets are coded for consistency with database that we are using to upload the data you send us. If the sheet is incorrectly coded, it is like trying to pass a square peg through a round hole. It just doesn’t work.

The list of approved Aeromonas laboratories has been expanded since the last UCMR Update was released. If you are still trying to find a laboratory to handle your Aeromonas analyses, be sure to follow the link at the end of this paragraph for the options. Remember that the lab that you use for Aeromonas analyses must be approved by EPA. The link for the list is http://www.epa.gov/safewater/standard/ucmr/aprvlabs.html.

VI. Coming Attractions

It came upon them in the fall of 1999, innocently enough. It looked to be an easy regulatory action. After three years of sampling, reporting, reviewing and barely clinging to sanity, they thought it was over. The survivors believed nothing like it could ever happen again. They were wrong.

UCMR CYCLE 2: The Next Batch
Coming to a PWS near you in 2006

While it reads like a B-horror movie trailer, the reality is that the UCMR is on a five-year cycle. So as this cycle concludes, a new one begins to take shape. It’s almost enough to keep you up at night, I know. However, the UCMR plays a crucial role in the protection of public health, a common goal of water systems, states, and the EPA. This new UCMR will require additional regulatory action to promulgate a different contaminant list and other specific requirements. We will keep all interested parties
informed about developments through the normal *Federal Register* publications, web postings, and most certainly the continued publication of the UCMR Update. Stay tuned.

**VII. Contact Information:**

A general reminder to laboratories and PWSs: when contacting EPA about UCMR issues, please use you USEPA Lab ID number or PWSID number, respectively.

General UCMR questions may be directed to the **Drinking Water Hotline** at:

1-800-426-4791

Questions regarding registration for or use of the SDWARS/UCMR reporting system may be directed to the **SDWARS Help Desk** at:

1-888-890-1995

Correspondence with TSC may be directed to:

**UCMR Coordinator**
Technical Support Center (MS-140)
U.S. Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, OH 45268
Fax: 513-569-7191
UCMR Forum Form

Name: __________________________________________________

PWSID#(or USEPA Lab ID#):_______________________________

PWS (or LAB) Name:______________________________________

UCMR Likes

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UCMR Dislikes

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Comments

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May we publish your comments?  ___ Yes  ___ No

Mail to Cory Wagner, c/o U.S. EPA, 26 W. M.L. King Dr., Cincinnati, OH  45268

Office of Water, Cincinnati, OH 45268, EPA-815-N-03-002a, April 2003
Appendix C:
The Golden Faucet Award
The UCMR Golden Faucet Award

For meritorious service in the implementation of the Unregulated Contaminant Monitoring Regulation, the Technical Support Center of the U.S. EPA confers this award upon:

Robert Poon
EPA Region 2
Appendix D
The *Aeromonas* Monitoring and Review Sheet
### 1. Public Water System:

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### 2. Contacts:

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<th>Sponsor Letter</th>
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<tbody>
<tr>
<td>Name</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Division</td>
<td>General Manager</td>
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</tr>
<tr>
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<tr>
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<tr>
<td>Phone</td>
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<tbody>
<tr>
<td>Name</td>
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Records: 1 of 3
Appendix E:
The Large System *Aeromonas* Data Reporting Sheet
## UCMR Aeromonas Large System Data

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<th>PWS</th>
<th>Water Quality Parameter</th>
<th>Laboratory Approved for Aeromonas Analysis</th>
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</table>

- **Aeromonas**
  - Data provided by EPA.
  - Analysis conducted in-house at the laboratory.

- **Water Quality Parameters**
  - pH, Temperature, Turbidity, Free Chloride, Total Chlorine.

- **EPA Use Only**
  - Includes schedule and SP type information.

- **PWS**
  - Unique identifier for water systems.

- **Laboratory Approved**
  - Specifies the laboratory approved for Aeromonas analysis.