OpenLine Newsletter

The newsletter for and about Utah's water supply operators
Summer 2003

Director's Report

Kevin Brown
Director
Division of Drinking Water

Well, another year has come and gone and the drought appears to continue on. Many municipalities and water districts are taking strict actions to help reduce water consumption in their service delivery areas. We are starting to hear reports of wells gone dry already and we haven't hit the irrigation season yet. I urge you to get your emergency response plans out, if you haven't already done so, and read through your procedures if you lose one or more of your sources of water.

We really didn't have a lot happening at the legislature this year legislation wise. Budget wise was a different story. The water loan funding and our operational budget were discussed quite heavily and had different outcomes.

On the water loan front (otherwise known as the 1/16% sales tax issue), the legislature left the sales tax revenue source in place for the Water Resources, Water Quality, and Drinking Water Boards. They did place a cap on how much can be used by the three entities, but we (Drinking Water Board) will have enough to meet our minimum state match requirement for the federal loans we receive. I expect there may be more discussion about this subject this summer and at next year's legislative session…stay tuned and stay involved.

On the operational budget side, we took some hits and as a result, will not be traveling much and we won't be contracting with the local health departments as much to do sanitary surveys. The legislature reduced our out of state travel budget by 45%, in state travel budget by 15%, and general fund pass through funds to local health departments for sanitary surveys by 72%. Many other Departmental programs were reduced or eliminated.

All in all, we came out in better shape than many would have predicted back in January. Thanks to all of you who supported us on many fronts!

As of this writing, I am sad to report that the Utah Drinking Water Board is losing two of its members in May 2003. Mr. Boyd Workman from the Ashley Valley Water District will have completed his second four-year term on the Board. Boyd has been and continues to be a tremendous asset to the water industry. Ms. Ruth Perry from Phillips Petroleum is retiring from her job with Phillips. I wish to thank both Boyd and Ruth for their service to the Drinking Water Board and to the water industry as a whole.

Finally, we will be working with the Rural Water Association of Utah to provide several seminars around the state to help water systems in the population categories of 3,300 to 99,999 complete vulnerability assessments and emergency response plans. The first set of seminars will commence in May and run throughout the year. Should you have any questions concerning the training, please don't hesitate to contact Russ Donaghue or Kim Dyches.

We have accomplished much but still have many challenges ahead of us. I want to thank each of you in the water industry for helping us accomplish our drinking water mission: To protect public health from water borne disease through education, assistance, and oversight. ■

New Laws Affect Water System Security

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In June of 2002, President Bush signed P.L. 107-188 into law. This law requires water systems to perform vulnerability assessments as part of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Community water systems serving populations greater than 3,300 are required by law to perform a vulnerability assessment on their water system to terrorist or other intentional attacks. The new law is an amendment to the Safe Drinking Water Act and will be inserted after section 1432. The new amendment is section 1433, Title XIV of the Public Health Service Act.

The new section places water systems on a timeline to complete their vulnerability assessment. Community water systems that serve populations greater than 100,000 had until March 31, 2003, to complete their assessment. Community systems serving populations from 50,000 to 99,999 have until December 31, 2003, to complete the assessment. The community systems serving 3,300 to 49,999 have a deadline of June 30, 2004. Once the water system completes the vulnerability assessment, they then have six months to complete an Emergency Response Plan. The systems are required to maintain a copy of the Emergency Response Plan for 5 years after the plan has been certified to the Administrator.

There is language written in the act that protects the vulnerability assessment document from unauthorized disclosure. Copies of the assessments will be kept in a secure location and only individuals designated by the Administrator shall have access to the documents. No copy of an assessment or part contained in an assessment will be available to anyone other than someone that has been designated by the Administrator. Anyone who reproduces an assessment or parts thereof and knowingly or recklessly reveals that information from the assessments is subject to fines and imprisonment.

There have been funds set aside to help water systems comply with the Bioterrorism Act. The section allows the Administrator to coordinate with state and local governments to administer funds to complete the assessments. Funds may also be used for expenses and contracts designed to address basic security enhancements of critical importance and significant threats to public health and drinking water supplies. Security enhancements may include intrusion detection equipment, fencing/gating, security cameras, lighting, tamperproof hydrants and manhole covers. Funds may be used for re-keying of locks, improvements to protect computer systems, personnel training and training materials. The funding may also be used for improvements in the use, storage or handling of chemicals. Costs incurred for the screening of employees or contractor support services may also be funded. Funding may not be used for personnel costs, or monitoring, operation, or maintenance of facilities equipment or systems.

The Bioterrorism Act also made changes to section 1431 of the Safe Drinking Water Act that addresses tampering or threatening a public water system. The old law gave penalties of 5 years imprisonment and/or $50,000 in fines for tampering with a public water system. Public Law 107-188 amended the Safe Drinking Water Act to increase the imprisonment to 20 years and the fines to $1,000,000. The old language for threatening to tamper with a public water system was 3 years

imprisonment and/or $20,000 in fines. The amended law increased the imprisonment to 10 years and/or fines to $100,000.

The language to P.L. 107-188 may be accessed from the Internet at http://tis.eh.doe.gov/biosafety/library/PL107-188.pdf. The section that addresses Drinking Water is on pages 90 through 95.

Notable State legislation that recently passed in the last legislative session was Senate Bill 75. S.B. 75 enacts provisions authorizing political subdivisions of the State that operate public water systems, the ability to require criminal background checks. Prospective or current employees, contractors, and those seeking access to public water system facilities may be required to submit to a criminal background check under the new law. ■

Membrane Technology for Drinking Water

Bob Hart, P.E.
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Division of Drinking Water

During the past decade, membrane technology for the treatment of surface water has gained considerable acceptance in the drinking water industry. This has been driven by the increasing regulatory requirements for treatment, particularly microbial contaminant removal, and the fact that membrane technology has become cost-competitive with conventional processes. In 1990, there was one major membrane plant in the United States operating with a capacity of 0.06 million gallons per day (mgd). EPA projected that by the end of 2001 there would be 120 plants in operation with an estimated cumulative capacity of 243 mgd. This includes two plants installed in the State of Utah in 1999 with a total capacity of 3.7 mgd. Some of the advantages of membrane technology include superior finished water quality, less chemical addition required, better removal of microbial contaminants, and less sludge production. Membrane plants are compact in size, typically come in modular units from the manufacturer, and are highly automated.

Membranes are typically synthetic materials with billions of microscopic holes or pores that act as a selective barrier allowing smaller constituents to pass through while blocking larger ones. Some of the materials used for membranes include polypropylene, polyvinyl difluoride, polysulfone, polyethersulfone, and cellulose acetate. Membrane technologies are classified by pore size, from largest to smallest, as microfiltration (MF), ultrafiltration (UF), nanofiltration (NF) and reverse osmosis (RO). Figure 1, taken from EPA's publication "Low-Pressure Membrane Filtration for Pathogen Removal: Application, Implementation, and Regulatory Issues" page 16, shows the approximate pore size in microns (μm, or one millionth of a meter, or 1/25,000 inch) for each technology, the approximate size of some contaminants, and the approximate size of molecules by molecular weight. The figure shows that the pore size of membranes can be smaller than the size of most turbidity particles, cysts such as cryptospordium, bacteria, viruses, and even organic molecules. Therefore, a membrane can be an absolute barrier to certain contaminants as long as membrane integrity is maintained. In addition, membrane can act as a support medium for a filter cake that may behave similar to a conventional anthracite filter in its electrostatic removal of particles much smaller than the channels themselves through the medium. Thus, membranes can successfully remove color, odor, arsenic, viruses, and other contaminants, even though the contaminant particles are smaller than the membrane pore. Sometimes, coagulants or powdered activated carbon (PAC) are added to the raw water prior to the membrane to increase particle size to remove certain constituents. The driving force to move water through the membrane is normally pressure

(transmembrane pressure or TMP), though it can be vacuum on the clean water side or electrical charge (electrodialysis). Figure 2 is a table that compares the membrane technologies.

Figure 2. Comparison of Membrane Technologies

	MICRO-FILTRATION MF	ULTRA-FILTRATION UF	NANO-FILTRATION NF	REVERSE OSMOSIS RO
PORE SIZE	0.1 to 1.0 μm	0.01 to 0.1 μm	0.001 to 0.01 μm	< 0.001 μm
REMOVES	Larger Particles Cysts Bacteria Turbidity	Larger Molecules Some Organic Compounds	Higher Charged Ions Viruses	Most Everything Dissolved Salts Viruses
PASSES	Dissolved Salts Small Particles Color Odors Viruses	Dissolved Salts Small Molecules Small Ions Viruses	Dissolved Salts Mono-Valent Ions Small Molecules	Very Small Uncharged Molecules
OPERATING PRESSURE	15 – 30 psi	~ 50 psi	50 – 200 psi	150 – 1000 psi

Most community water systems use MF and UF membrane technologies. RO membrane technology is used where the need for desalination of a water source is required. NF membrane technology is used more for specialized applications where the need exists for extra high purity water such as the semi-conductor industry. The most common configuration of MF and UF membranes used for drinking water treatment is the hollow fiber configuration. Typically, hollow membrane fibers are bundled in groups of several thousand, potted in a resin on each end, and housed in a pressure vessel called a module. The modules can be operated in an inside-out mode. Raw water goes into the inside of the fibers and the clean water is collected from the outside. But the more common approach is outside-in mode. Raw water is applied to the outside of the fibers and the clean water is collected from the inside.

Most membrane systems include some pretreatment such as bag filtration (typically 1 to 40 microns pore size) to remove the large sized particles prior to the membrane. This limits the fouling of the membrane as the material builds up on the raw water side of the membrane. In addition, periodic backwashing of the membrane is needed to remove filtered materials from the membrane surface and restore performance. The backwash uses raw water flow on the fouled side of the membrane to wash away the buildup and finished water and/or air can also be forced from the membrane interior side back out to the raw water side to enhance cleaning. Backwashing is typically required every 10-30 minutes of operation and takes around a minute to complete. Over a period of weeks, there will be some fouling of the membrane that backwashing cannot remove which requires periodic chemical cleaning to restore membrane performance. After several years, the level of irreversible fouling will be such that the membrane will have to be replaced. Membranes have also had problems with scaling and biofouling in some waters.

It is also important that the physical integrity of the membrane be monitored. A breach in integrity resulting from a broken or damaged fiber or seal could compromise the physical barrier against particles and organisms. This risk is one of the disadvantages of using a single barrier for protection. There are both indirect and direct methods that are used to monitor membrane integrity. The indirect method

monitors some characteristic of the filtered water such as turbidity or particle counts, which is required in Utah, as a surrogate for membrane integrity. The advantage of the indirect methods is that the monitoring can be continuous while the filter is in operation. Direct methods, such as the pressure hold test or diffusive air flow test, require the membrane to be out of service during testing. The advantage is that direct testing is very sensitive and can detect even a small number of broken fibers in a rack of multi-fiber modules. A direct test would typically be performed only once per day.

Because membrane technology can produce superior quality water, can meet the increasing regulatory requirements for the removal of microorganisms, and is cost competitive with other technologies, the number and size of membrane plants will only continue to increase. Membrane technology was evaluated for the new Point-of-the-Mountain water treatment plant to be built in Draper by the Metropolitan Water District of Salt Lake and Sandy. Two pilot plant studies lasting four and six months were conducted utilizing four commercial MF and UF systems. ■

Something About Arsenic

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The Environmental Protection Agency (EPA) published clarifications of the new arsenic rule on March 25, 2003, regarding the arsenic maximum contaminant level (MCL) and the compliance date for the new arsenic standard:

1) EPA revised the rule text to express the new arsenic MCL as 0.010 mg/L (i.e., 10 parts per billion or 10 ppb) instead of 0.01 mg/L to clarify the rounding issue.

2) EPA reiterated that the compliance deadline for the new arsenic standard is January 23, 2006, for all community water systems and nontransient noncommunity systems.

The new arsenic rule applies to all water source types (including surface water, ground water, and ground water under the direct influence of surface water). The new arsenic rule does not apply to transient noncommunity water systems. The Utah Division of Drinking Water database indicates there are 39 water systems and 118 sources in Utah exceeding the new arsenic MCL of 10 ppb.

Arsenic is present primarily in two forms: arsenate (arsenic in pentavalent form) and arsenite (arsenic in trivalent form). Arsenate, which is the more oxidized valence state, is typically more common in surface water or aerobic conditions. Arsenite, which is more difficult to remove, is typically more common in ground water or anaerobic conditions. Arsenite is easily oxidized to arsenate with conventional oxidation methods such as chlorination. It is likely that more than half of all ground water systems that install arsenic removal treatment will require pre-oxidation of arsenite to arsenate. Water system managers should first perform an arsenic speciation test to determine what form of arsenic they have in their water source and whether or not pre-oxidation is needed.

In the satellite broadcast *Arsenic Rule Training* in January 2003, EPA recommended a four-step mitigation strategy in dealing with the new arsenic rule:

STEP 1. WATER QUALITY MONITORING - All community water systems, as well as nontransient noncommunity systems, will be required to take an initial arsenic sample at each entry point to the distribution system within a prescribed period of time of the effective date of the new arsenic rule, which is January 23, 2006. Namely, surface water systems must take the initial samples by December 31, 2006, and ground water systems must take the initial samples by December 31, 2007.

If the initial monitoring sample is at or less than 10 ppb, no additional treatment is required. However, routine monitoring for arsenic must still be performed. The routine sampling frequency is annual sampling for surface water systems and one arsenic sample every three years for ground water systems. Any MCL exceedances will trigger quarterly monitoring. A system with a sample result above the MCL must collect quarterly sampling until the result is reliably and consistently below the MCL, which is typically interpreted to be a minimum of two samples for ground water sources and four samples for surface water sources. The routine sampling is conducted at the water sources. If the water system does blending or seasonal use of water sources of various arsenic levels, the monitoring sampling shall also be conducted within the distribution system. Blending or seasonal use of high arsenic sources must be approved by the State and/or EPA. To comply with the new MCL, the running annual average of arsenic concentration at a sampling point must not exceed 10 ppb. The running annual average is the sum of arsenic results from the previous four quarters divided by the number of samples taken.

STEP 2. TREATMENT AVOIDANCE - If the arsenic level in your water system is above 10 ppb, you may look into the following options prior to considering installation of centralized arsenic removal treatment:

1. Develop alternative sources, such as changing the sources of your system, developing new sources that meet the new MCL, or partnering with other water systems (note: bottled water cannot be used as a permanent solution);
2. Abandon high arsenic sources;
3. Blend high arsenic sources and low arsenic sources to achieve less than 10 ppb at each entry point of the distribution system;
4. Reduce the use of high arsenic sources to seasonal use and blend with low arsenic sources to accomplish an annual average less than 10 ppb; and
5. Install point-of-use devices (activated alumina or reverse osmosis) for arsenic removal on a single tap in each customer's household with regular inspection and maintenance performed by the water system (this option may be viable for very small systems).

STEP 3. OPTIMIZATION OF EXISTING TREATMENT - If it is necessary to reduce arsenic level in the source water, the system may first optimize any existing treatment facilities to achieve arsenic removal:

1. Iron and manganese removal — oxidation of arsenite to arsenate followed by precipitation or adsorption of metal hydroxides using existing iron and manganese removal facilities.
2. Enhanced coagulation and filtration — adding coagulant such as alum or ferric chloride to form metal hydroxide precipitates followed by filtration using existing coagulation and filtration facilities.
3. Enhanced lime softening — adding excess lime (calcium hydroxide) to achieve pH greater than 11.5 to precipitate calcium and magnesium solids and remove arsenic with these precipitates followed by clarification or filtration using existing hardness removal facilities.

STEP 4. ADDITION OF NEW FACILITIES OR TECHNOLOGIES - In addition to the technologies above, water systems that need to install new arsenic removal facilities have two alternative technologies — membrane filtration and sorption. In order to select the best arsenic removal technology for your water system, the following factors should be carefully considered and pilot testing is always a good idea:

- Raw water quality (pH, speciation of total arsenic, competing species of arsenic, sulfate, sodium, fluoride, chloride, iron, magnesium, manganese, phosphates, silica, nitrate/nitrite, total suspended solids, total dissolved solids, heavy metals, hardness, alkalinity, turbidity, etc.)
- Capacity of sources
- Location of sources
- Maximum system demand
- Water loss during the process
- Ease of operation and maintenance
- Labor demand
- Land and space availability
- Capital, operation, and maintenance costs
- Waste disposal

Membrane filtration processes may require pretreatment to prevent scaling, plugging, and colloidal or biological fouling of the membrane.

1. Coagulation assisted filtration — adding ferric chloride during pre-coagulation and using pressure or vacuum to drive raw water through a microfiltration or ultrafiltration membrane.
2. Nanofiltration — using hydrostatic pressure to force raw water through a membrane of pore size less than 1 nanometer, i.e., 10^{-9} meters.
3. Reverse osmosis — using high hydrostatic pressure to force raw water through a semi-permeable membrane that does not allow passage of dissolved contaminants in order to reduce arsenic and other contaminants to very low levels.

Sorption processes use adsorptive media to remove arsenic from the water. There are two types of adsorptive media: the throw-away type and the regenerative type. The throw-away type may be a viable option for small water systems.

1. Ion exchange (cation exchange and anion exchange) — removing arsenic from the water based on arsenic's affinity to various types of resins housed in column containers. Sodium chloride brine is used for regeneration of the resins. Ion exchange is recommended for small ground water systems with low sulfate, TDS, selenium, fluoride, and nitrate, and for polishing process after filtration.
2. Activated alumina — using porous granular aluminum trioxide as adsorptive media that is typically housed in a downflow filter unit. Activated alumina removes arsenate effectively and, therefore, may require adding chemical to adjust pH to higher level where arsenate predominates over other arsenic species.
3. Granular ferric hydroxide (GFH) — using GFH as absorptive media designed for the removal of arsenic (both arsenite and arsenate), phosphates, chromium, and other heavy metals. Current GFH technology requires backwashing and media replacement after breakthrough.

PLEASE CONTACT the staff of the Division of Drinking Water if you are interested in more detailed information on these technologies. ■

Ground Water Rule

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The EPA Ground Water Rule (GWR) was schedule to be issued as a final regulation in the spring of 2003. EPA now indicates that the target date for the GWR is November of 2003. The GWR will apply to all public drinking water systems using ground water not under direct affect of surface water.

The proposed Ground Water Rule has a number of requirements that could significantly affect Utah's public drinking water systems. The proposed requirements are as follows:

SYSTEM SANITARY SURVEYS will be conducted by the Division to identify significant deficiencies. Surveys will include a review of: sources, treatment facilities, distribution systems, finished water storage, pumping facilities, controls, monitoring results, record keeping and reporting, data verification, water system management and operations, and operator compliance with Utah Public Drinking Water Rules. Surveys will be conducted on community water systems every three years and every five years on non-community systems.

From the survey, the Division will provide a list of deficiencies to the system within 30 days of the completion of the survey. If any deficiencies list are considered a "significant deficiency", the system has 90 days, from receipt of the list, to address the deficiencies by: eliminating the contamination source, correct the significant deficiencies, provide alternative source water, or install a treatment process. If this cannot be accomplished within the 90-day period the system may negotiate a revised time schedule with the Division.

EPA has not and probably will not create a list of "significant deficiencies" in the federal rule. Therefore the Division will have to create a list of deficiencies that would be considered significant and require the system to install permanent disinfection treatment. "Significant" deficiency includes: a defect in design, operation, or maintenance of facilities, or a failure or malfunction of the sources, treatment, storage, or distribution system equipment that the Division determines to be causing, or has the potential for causing the introduction of contamination into the water delivered to consumers.

ONE-TIME HYDROGEOLOGIC SENSITIVITY ASSESSMENTS must be performed for all ground water systems that do not permanently disinfect to identify those systems located in sensitive aquifers. The purpose of the evaluation is to determine if sources are "sensitive" to microbial contamination. This is a one-time assessment and must be performed within six years of the final rule's date of publication for community water systems and eight years for non-transient non-community and non-community water systems. The Division is currently investigating if the protected or unprotected aquifer classifications in the previously submitted source protection plans contain enough information to determine sensitivity. The rule identifies karst, gravel, or fractured bedrock aquifers as "sensitive" to microbial contamination. The Division may waive source water monitoring for sources with protected aquifer classification, because it documents the presence of a hydrogeologic barrier to fecal contamination.

If a source is determined to be sensitive (unprotected aquifer classification), then the system must monitor monthly for fecal indicator organisms including viruses at the source once a month for a year. If

such indicators are found to be present, the system must eliminate the source of contamination, provide an alternative source of water, or install an effective treatment process.

Routine sampling will be required for systems deemed by the State to be hydrogeologically sensitive (unprotected aquifer classification). Systems must conduct monthly source water monitoring for fecal indicators. Sampling frequency may be reduced after twelve negative samples.

Triggered microbial monitoring must be performed by systems that do not disinfect and have any routine sample taken in the distribution system test positive for total coliform. The system must then collect one source sample and monitor for a fecal indicator.

CORRECTIVE ACTIONS must be taken by any ground water system with significant deficiencies or positive microbial samples indicating fecal contamination. Systems must notify the Division of completion of improvements to their water system (referred to as "corrective action" in the proposed rule) or the Division must confirm correction within 30 days after the 90-day period or scheduled correction date.

COMPLIANCE MONITORING applies to all groundwater systems that notify the Division that they disinfect in order to avoid source water monitoring, and to systems that disinfect as a corrective action.

Systems providing treatment must monitor the treatment process to ensure that it is effective. The rule defines effective as: at least 4-log virus inactivation and/or removal. The measurement of 4-log removal will not be made, but it will be calculated based on the disinfection contact time (a function of the storage or contact chamber size) and the measured concentration of disinfectant. In order to track compliance with the required concentration of disinfectant, systems serving less than 3,300 must monitor disinfection treatment once daily, while systems serving 3,300 or more people must monitor continuously. If monitoring shows the disinfectant concentration to be below the required level, the system must restore the disinfectant concentration within four hours or notify the Division of their failure to provide adequate disinfection.

IN GENERAL, the Division of Drinking Water feels this rule, if EPA empowers the state with flexibility on how it implements the various elements, could be implemented in such a way as to be protective of public health and consequently justifiable.

For more information, you can call EPA's Safe Drinking Water Hotline at 800-426-4791. A copy of the proposed rule is available on the web at: **http://www.epa.gov/safewater/gwr.html** ■

Disinfection Regulations

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It is not a stretch to say that there are more and regulations on our drinking water every year. There seem to be updates of current rules always in the works, while new rules continue to be thought up. It is important for a water system owner to be up to date on these rules and those that are continually being proposed in order to anticipate the needs of their system.

There are many systems that are making changes to enhance their water quality and better serve and protect their consumers by adding disinfection and oxidation to their water treatment process. This is an area of regulation that is currently under going many changes due to increased efforts to balance the risks between microbial pathogens and disinfection byproducts and their precursors. These issues are addressed in the Disinfectant and Disinfection Byproducts Rule (DBPR). When you and your engineer are deciding which chemical disinfectant to use, you need to take into account the regulatory requirements for that chemical as well. There are many choices available, but each carry different monitoring responsibilities. While only surface water systems with a population greater than 10,000 are currently impacted by this rule, by January 1, 2004 all will be. A quarterly report is required for systems covered by this rule. Following is a list of possible choices and the requirements for each.

While only surface water systems with a population greater than 10,000 are currently impacted by this rule, by January 1, 2004, all will be.

Chlorine and chloramines have been the popular choice for most of a century. All community and non-transient non-community (NTNC) systems using chlorine or chloramines are required to take a minimum of three residual disinfection samples per week in the distribution system. You must take chlorine residuals at the same time as all your bacteriologic samples and count them towards the chlorine samples required. You must also sample for Total Trihalomethanes (TTHM's) and Haloacetic acids (HAA5's), depending on your system size, from four samples per quarter per plant if you are a surface water system over 10,000, to one sample per year per plant for groundwater systems with a population less than 10,000

In many parts of the world, and increasingly here, ozonation is employed as part of the treatment process. Cost will almost certainly preclude any smaller systems using this technology, but the use of ozone will require additional monitoring for the disinfection byproduct Bromate. One sample per month per plant is required, and if you are allowed to reduce sampling to one per plant per quarter, you must also sample monthly for the precursor bromide. It should also be noted that monitoring for whichever disinfectant is used to maintain a distribution residual must also occur. Bromate sampling applies only to community and NTNC systems.

Chlorine Dioxide is a choice we are hearing more about recently. Chlorine dioxide sampling applies to all systems, including transient systems. Chlorine dioxide is considered an acute contaminant and the exceedance of the maximum residual disinfection level (MRDL) of 0.8 mg/L will result in a tier 1 public notice requiring public notification within 24 hours. Sampling for chlorine dioxide must occur daily at the entrance to the distribution system. Any MRDL exceedances will require three distribution samples the following day. TTHM's and HAA5's must also be sampled for depending on the system size, along with the disinfection byproduct chlorite. Chlorite sampling must occur daily at the entrance to the distribution system along with a monthly three-set sample in the distribution system. If the daily chlorite sample exceeds the maximum contaminant level (MCL), then an additional three-set sample must be taken the following day in the distribution system. This last sample may be used to satisfy the monthly three-set sample requirement. Transient systems are not required to sample for chlorite.

You should be aware that if you choose to use mixed oxidants in your system, you would be required to do all of the sampling previously mentioned.

Please remember that these are only requirements for the use of disinfectants. Surface water treatment itself has many monitoring requirements that must be met in addition to these.

We invite you to include the Division of Drinking Water in your decision making process. We are interested in getting involved in the process in the planning stage and not just when building plans are submitted for engineering approval. We also can discuss any rules that might be on the horizon that could affect your plans. Working together, we hope to address any problems and develop a good working relationship from the beginning. ■

Operator Certification Compliance

D. Kim Dyches
Secretary
Operator Certification Commission

The February 2003 deadline requiring all **community** and **nontransient noncommunity** water systems to have a certified operator has now passed. There are some compliance issues that these water systems need to be aware of. First of all, this rule applied mainly to small system and distribution grade I operators of systems that serve populations of 25 to 800. The state of Utah has had mandatory operator certification since the mid-1980s. The state has also required operators to be certified in the treatment discipline for water systems that treat surface water or utilize complete treatment techniques for any source.

There are some significant rules and penalties that come into play now that the February deadline has passed. There are now 30 penalty points awarded to those water systems that have not complied with the operator certification requirements. Also, water operators who qualified for a grandparent certificate also need to meet the 0.7 CEU of pre-certification training in their first renewal cycle as part of the 2.0 CEUs needed to renew their certificate. The Utah Water Operator Certification Program requires water operators to be certified if they are in direct responsible charge of the water system. These water operators need to be certified to, or higher than, the grade of the water system.

The Operator Certification Commission of Utah has allowed extra dates for administering exams to operators. The extra dates were appropriated to help operators comply with the new rules. The remaining exam dates for 2003 are September 19th in Park City in conjunction with the Rural Water Association of Utah summer conference, and the final exam on November 7th at sixteen exam locations around the state. The dates set for 2004 are February 27th at the Rural Water Association of Utah annual conference in St. George, and April 9th and November 12th at sixteen exam locations around the state. ■

Source Protection Resources

Kate Johnson
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Division of Drinking Water

It's common for the Source Protection staff to get phone calls from citizens, local government, and water systems operators who are looking for help in resolving issues with potential contamination sources. Here are a few resources you should be aware of.

Septic Tanks: The Division of Water Quality has low (presently 3%) interest loans available to help homeowners repair or replace septic tanks or drain fields. The local health department must inspect the

system, and provide a "Certificate of Qualification". The homeowner has to meet some income criteria. Businesses are not eligible for these loans. Contact Shelly Quick, Division of Water Quality, at (801) 538-6516 or by e-mail at squick@utah.gov for more information.

Non-point sources of contamination: A non-point source is a source of contamination spread out over an area rather than all at one location. The Division of Water Quality has no (0%) interest loans available to help reduce contamination from these kinds of sources. These are usually agriculture-based water quality improvement projects. There is no affordability criteria but collateral is required (land, water rights or other appropriate collateral). This money can be used for composting, manure management, water protection, remediation, and habitat protection. Contact Shelly Quick, Division of Water Quality, at (801) 538-6516 or by e-mail at squick@utah.gov for more information.

General Assistance with Agricultural Issues: Mark Petersen, who is the Director of Water Quality Programs for the Utah Farm Bureau, is available to help with agricultural issues that may affect the quality of your drinking water. He can be reached at (801) 233-3014 or by e-mail at mmpetersen@fbfs.com.

Ordinances: You may be able to help protect your drinking water source by utilizing local ordinances! The Division of Drinking Water has compiled a list of counties and municipalities that have source protection ordinances. If you would like a copy of this list to see if your system is in an area with such ordinances, please call Kate Johnson, Division of Drinking Water, at (801) 536-4206 or by e-mail at katej@utah.gov. The list can also be reviewed on our web site, at http://www.drinkingwater.utah.gov/source_protection_intro.htm

Fact Sheets: The Department of Environmental Quality publishes Fact Sheets that contain information about reducing the risk of contamination from septic tanks, household hazardous waste, pesticides, fertilizers, and several other kinds of potential contamination sources. The Fact Sheets can be used to educate the public and businesses about how they can help prevent pollution. They can be viewed and downloaded at http://www.drinkingwater.utah.gov/source_protection_intro.htm. ■

Summary of Rules Adopted by the Drinking Water Board

100 Series: Administration of the Drinking Water Program.

R309-100. Administration: Drinking Water Program.
This rule defines a public water system, outlines the categories of public water systems, the Division's right of entrance to facilities of a public water system, sanitary survey requirements and the conditions for variances and exemptions.

R309-105. Administration: General Responsibilities of Public Water Systems.
This rule outlines the basic responsibilities of Public Water Systems in many cases referring them to the appropriate rule for further detail (i.e. source protection, operator certification, etc). It outlines the requirements for cross connection control programs, minimum operating pressures, some of the reporting requirements, record maintenance and outlines reportable emergency situations.

R309-110. Administration: Definitions.
This rule list the terms used throughout all the Board's rules and establishes a single definition for these terms.

R309-115. Administration: Administrative Procedures.

This rule sets out procedures for conducting adjudicative proceedings under the Utah Safe Drinking Water Act and Administrative Procedures Act. The rule establishes the procedures to be used for an appeal of an order or notice of violation.

200 Series: Drinking Water Standards, Monitoring, Reporting and Record Maintenance.

R309-200. Monitoring and Water Quality: Drinking Water Standards.

This rule establishes the water quality and treatment technique standards for bacteriological and chemical quality of the water. Drinking Water standards have been set for total and fecal coliform, nitrate, nitrite, inorganics & metals, lead & copper, radionuclides, asbestos, turbidity, volatile organic contaminants, pesticides and disinfection byproducts. Treatment techniques have been set for log removal of viruses, *Giardia lamblia* and *Cryptosporidium*. The standards are divided between Primary standards or those that have a health impact if exceeded and Secondary or those that affect the aesthetic quality of the water.

R309-205. Monitoring and Water Quality: Source Monitoring Requirements.

This rule outlines the monitoring requirements and compliance determinations for sample required to be sampled at the source. Different types of public water systems are required to monitor different parameter groups. Nitrate, Nitrite, Asbestos, Inorganic & metals, Volatile Organic Contaminants, Pesticides, Radionuclides and Turbidity have source water monitoring requirements.

R309-210. Monitoring and Water Quality: Distribution System Monitoring Requirements.

This rule outlines the monitoring requirements and compliance determinations for sample required to be sampled at representative sites in the distribution system. Different types of public water systems are required to monitor different parameter groups. Total Coliform, Asbestos, Lead & Copper, and Disinfection Byproducts have distribution system water monitoring requirements.

R309-215. Monitoring and Water Quality: Treatment Plant Monitoring Requirements.

This rule outlines the monitoring requirements and compliance determinations for sample required to be sampled at the treatment plant. Different treatment technologies may have slightly different standards. For Surface Water treatment facilities this rule outlines the monitoring requirements and compliance determination for turbidity and disinfection byproduct precursors. It also outlines filter profiling and benchmarking requirements.

R309-220. Monitoring and Water Quality: Public Notification.

This rule outlines the requirements for all public water systems for public notification. Public notification is required for: MCL exceedances, monitoring violations, treatment technique violations, waterborne disease outbreaks and variance and exemption schedule violations. The violations are further categorized into Tier 1 most serious water quality problems (immediate public health impact), Tier 2 other MCL violations subject to chronic health impacts and the more procedural type Tier 3 violations consisting of monitoring violations.

R309-225. Monitoring and Water Quality: Consumer Confidence Reports.

This rule outlines the form and content of annual water quality report produced by community water systems and given to their consumers. These Consumer Confidence Reports are required to be produced by all community water systems. The reports are required to contain information on detected contaminants (even if below the MCL), water system contact information, violation history, and standard paragraphs provided by EPA. The delivery of these reports vary by system size, from direct mail to publication in the newspaper to notification of availability.

300 Series: Certification of Public Water Supply Operators and Backflow Technicians.

R309-300. Certification: Drinking Water Operators.

This rule covers the certification of water system operators. All community and nontransient noncommunity water systems as well as any public water system with a surface water source are required to have a certified operator. The rule outlines the testing process, certification and renewal process. The rule also establishes the Operator Certification Commission and its representation of the drinking water industry.

R309-302. Backflow Technicians. (Future R309-305)

This rule covers the certification of all individuals who are: a) involved in the administration or enforcement of a cross connection control program being administered by a drinking water system; b) testing, maintaining and/or repairing backflow prevention assemblies; and c) instructors of backflow technician certification courses. The rule outlines the testing process, certification and renewal process. The rule also establishes the Cross Connection Control Commission and its representation of the drinking water and backflow industries.

400 Series: Compliance Determinations and Enforcement.

R309-150. Water System Rating Criteria. (Future R309-400)

The rule sets forth the rating criteria and specifies the points associated with the infraction of the Board's rules. This rule is also known as the "Improvement Priority System" or "IPS" rule. This rule establishes a way for Division staff to evaluate the condition and performance of a water system based all of the following parameters: water quality, monitoring, public notification, physical deficiencies, operator certification, cross connection control and source protection. This holistic view of the water system provides Division staff with an objective mechanism to prioritize Division compliance resources.

R309-405. Compliance and Enforcement: Administrative Penalty.

This rule outline the criteria and procedures the Board will use in assessing penalties to public drinking water systems for violation of its rules. The criteria is intended to be flexible and liberally construed to achieve a fair, just and equitable result with the intent of returning a public water system to compliance.

500 Series: Drinking Water Facility Construction Design and Operation.

R309-500. Facility Design and Operation: Plan Review Operation and Maintenance Requirements.
R309-505. Facility Design and Operation: Minimum Treatment Requirements.
R309-510. Facility Design and Operation: Minimum Sizing Requirements.
R309-204. Facility Design and Operation: Source Development. (Future R309-515)
R309-520. Facility Design and Operation: Disinfection.
R309-525. Facility Design and Operation: Conventional Surface Water Treatment.
R309-530. Facility Design and Operation: Alternative Surface Water Treatment Methods.
R309-535. Facility Design and Operation: Miscellaneous Treatment Methods.
R309-540. Facility Design and Operation: Pump Stations.
R309-545. Facility Design and Operation: Drinking Water Storage Tanks.
R309-550. Facility Design and Operation: Transmission and Distribution Pipelines.

600 Series: Drinking Water Source Protection Management.

R309-600. Drinking Water Source Protection for Ground Water Sources Rule.
R309-605. Source Protection: Drinking Water Source Protection for Surface Water Sources.

700 Series: Financial Assistance Programs.

R309-700. Financial Assistance: State Drinking Water Project Revolving Loan Program.
R309-705. Financial Assistance: Federal Drinking Water Project Revolving Loan Program.

800 Series: Capacity Assessment of Public Drinking Water Systems with Project for Funding.
R309-352. Capacity Development Program ■

Federal Expense Reimbursement Grant Money Available to Utah's Small Water Systems

In September 2001 the Utah Division of Drinking Water (DDW) Operator Certification Program submitted a work plan to the U.S. Environmental Protection Agency (USEPA) for federal money to implement the new rules for small water systems. In submitting the work plan, the State had to justify expenses that the DDW would incur, plus the cost to the operator to get certified. Some of the reimbursable costs that qualify are lodging, travel, cost of training course materials, exam fees, and the cost of the training course. Certified operators who must attend training for CEU credit may be reimbursed for training expenses.

In February 2002 the State received approval from USEPA Region 8 to implement the work plan. The allotment for the State was over $867,000 for small systems serving less than 3,300 people.

In order to keep the administrative costs down and to use more of the money for operator expenses, the State has contracted with the Rural Water Association of Utah (RWAU) to administer the funds to the operators. Small system operators who are interested in applying for reimbursement of expenses are urged to call the RWAU or the DDW for guidance as to who and what expenses qualify for reimbursement. ■

Rural Water Association of Utah
Attn: Linda Russell
76 E. Red Pine Drive
Alpine, Utah 84004
Telephone: (801) 756-5123
E-mail: rwau@rwau.net
Fax: 801-756-5036

Division of Drinking Water
Operator Certification Program
150 North 1950 West
P.O. Box 144830
Salt Lake City, Utah 84114-4830
Telephone: (801) 536-4200
E-mail: kdyches@utah.gov
Fax: 801-536-4211

Joke of the Day

One day a minister was reviewing his congregation in his mind and remembered that he hadn't seen Mrs. Gladstone, and elderly widow, for some time. So he resolved to pay her a visit to see if everything was okay.

During his visit, Mrs. Gladstone reported to the minister on the activities and involvements of her children, grandchildren and happily reported on the arrival of her second great-grandchild. She pulled out her box of photos and showed each picture to the minister and gave him a detailed explanation of each photo.

After the pictures were shown, the conversation turned to Mrs. Gladstone's dear departed husband. He was such a good father, husband and provider. The time she had spent with him had been some of the happiest times of her life.

Through all of this the minister sensed that Mrs. Gladstone seemed to be alert and in good health, but she was lonely. Also realizing that she was getting on in years, and knowing she may have certain spiritual concerns, he decided to discuss the benefits of regular church attendance.

He introduced the change of discussion topics by saying: "You know Mrs. Gladstone, a person of your age should be thinking about the here after". To which Mrs. Gladstone replied: "Oh reverend, I think about the here after all the time. Why I go to the kitchen, the bedroom or out into the garage and I find myself asking, what am I here after?" ■

2002 Operator Certification Renewals

A TOTAL OF 523 UTAH OPERATOR CERTIFICATES were due to expire on December 31, 2002. The operators were required to accrue a sufficient amount of continuing education units (CEUs) in a three-year period in order to be eligible for renewal.

The following operators have submitted CEU records and renewal applications for a new three-year certification period (January 1, 2003, to December 31, 2005). These operators are to be commended for their dedication to safe drinking water, their hard work and professionalism.

Operator Name	Utah Water System	Cert/Grade
Adamson, C. Scott	Salt Lake City	T-IV
Aldridge, David M.	Midvalley Estates Wtr Co	D-I
Allen, Bevan H.	Holliday Water Co	T-IV
Allen, Christopher J.	Vernal City	D-II
Anglade, Marcelo A.	Jordan Valley WCD	D-IV
Anglin, Steven C.	Uintah Highlands ID	D-IV
Arnold, Michael S.	Sandy City	D-IV
Astill, Danny J.	Murray City	D-IV
Atkinson, Terry	Water Specialist	D-II
Austill, Kevin R.	American Fork City	D-III
Backman, Gus P.	Salt Lake City	D-IV
Backman, Ronald E.	Centerville City	D-IV
Baker, Evan L.	Pine Mountains Mutual	D-I
Baker, James L.	Energy West Mining Co	T-II
Banks, Marvin J.	Spanish Fork City	D-III
Barnes, Dennis G.	Santaquin City	D-III
Barnes, E. Lee	Lehi City	D-IV
Barnett, Timothy S.	Bountiful City	T-IV
Barrett, Gary D.	Salt Lake City	D-IV
Baum, Russell J.	Granger-Hunter ID	D-IV
Beaver, Tim J.	Water Specialist	D-I
Beck, Steven M.	Jordan Valley WCD	D-IV
Beckstead, Carl R.	Energy West Mining Co	T-II
Bell, Randy	Castle Valley SSD	T-II
Belliston, Troy	Granger-Hunter ID	D-IV
Belnap, Scott A.	Garland City	D-II
Bennett, Shane D.	Draper City	D-I
Beratto, David H.	Jordan Valley WCD	D-IV
Bevins, Michael J.	Water Specialist	T-II

Bird, M. Scott	Mapleton City	D-III
Black, R. Bruce	Pleasant Grove City	D-III
Blair, Mark H.	Lewiston City	D-II
Bohn, Patrick C.	Salt Lake City	T-IV
Bollwinkel, John E.	Gorgoza Mutual Water Co	D-III, T-III
Boshard, David J.	North Fork SSD	D-IV, T-IV
Bowler, Scott L.	St George City	D-IV
Brimhall, Richard J.	Provo City	D-IV
Brown, Albert E.	Metropolitan WD of SLS	D-I
Brown, Harold M.	Salt Lake City	T-IV
Brown, James E.	Water Specialist	D-II
Bryner, Ross L.	Price River WID	D-IV
Buck, Albert K.	Tooele City	D-IV
Budge, Jeffrey D.	White City WID	T-IV
Burt, David E.	Canyonlands Nat'l Park	T-I
Butterfield, Maury J.	Jordan Valley WCD	D-IV
Cain, Barry H.	Ashley National Forest	D-II, T-III
Cameron, Max J.	Payson City	D-III
Carbine, James W.	Mountain Regional WSSD	T-IV
Carlson, Brian W.	Farmington City	D-IV
Carman, John R.	Metropolitan WD of SLS	T-IV
Carney, Charles L.	Washington County WCD	T-II
Carroll, Garn E.	Bountiful City	D-III, T-IV
Carter, Barry K.	Water Specialist	T-IV
Carter, Chris B.	Provo City	D-IV
Cattelan, Frank	Echo Mutual Water Co	D-I
Chappel, James M.	Spanish Fork City	D-IV
Chase, Floyd W.	LDS Hospital	D-II
Chatwin, Maurice C.	Timberlakes Water SSD	T-II
Childers, Henry F.	St George City	D-IV
Childs, Donald R.	Gunnison City	D-III
Christen, Ron S.	Provo City	D-II
Christiansen, Scott S.	Hooper WID	D-IV
Clark, Dan L.	Salt Lake City	T-IV
Clark, Mark H.	Weber Basin WCD	D-I
Clayburn, Scott	Park City	D-III, T-II
Claypool, Daniel L.	Jordan Valley WCD	T-III
Coburn, Terry R.	Layton City	D-IV
Collier, Glen W.	West Point City	D-IV
Cossey, Val E.	Jordan Valley WCD	D-IV
Covey, Max L.	Jordanelle SSD	T-IV
Creamer, J. Lynn	Nordic Mountain Wtr Co	D-I
Crump, Danny R.	Riverton City	D-IV
Cummings, Ross J.	Fillmore City	D-III
Daley, James L.	High Valley Water Co	D-I
Davis, Larry Mike	Vernal City	D-IV
Dawson, Ron C.	Taylorsville-Bennion ID	D-IV
Decker, David K.	Layton City	D-IV
Defa, Jody J.	Timberlakes Water SSD	D-IV, T-III
Dennis, Patrick P.	Draper Irrigation Co	T-IV
Despain, Thomas H.	Murray City	D-IV
Devey, Daryl L.	Central Utah WCD	D-IV
DeVries, Michael J.	Metropolitan WD of SLS	D-IV
Deware, Allan W.	Erda Acres Water Co	D-I
Deweese, Zane	Summit Co Public Works	D-II
Dickson, William L.	East Carbon City	T-II
DiLello, Anna	Sandy City	D-IV
Donoghue, Russ O.	Water Specialist	D-II
Doolan, Timothy E.	Ogden City	D-IV

Douglas, Shane W.	South Ogden City	D-IV
Duncan, Neil K.	Jordan Valley WCD	D-IV
Durrant, Gary C.	Metropolitan WD of SLS	T-IV
Eddy, Louis K.	Weber Basin WCD	D-IV
Edwards, Timothy P.	St George City	D-I
Egan, John R.	Zion Panorama Owners Asn	D-I
Eggett, Brett K.	Bountiful City	T-IV
Elmer, Jeffrey F.	Roy City	D-IV
Bronson, Vernal W.	Hill Air Force Base	D-II
Cahoon, Brett B.	Washington County WCD	D-II
Callison, James	Water Specialist	T-IV
Carlson, S. Scott	Water Specialist	D-II
deJong, Frank	Kearns ID	D-IV
Desimone, Vincent R	Mountain Top Subdivision	D-I
Dunn, Dorene R.	Clearfield City	D-I
Emerson, Rocky G.	Sandy City	D-IV
Engleman, Philip J.	Glen Canyon NRA	D-II
Eyre, Jon F.	Salt Lake City	T-IV
Farnsworth, Bruce A	Orem City	D-IV
Farr, Wayne N.	Summit Water Distribution	D-II
Felicia, Marcel	Water Specialist	D-II
Fenn, Kevin W.	Taylorsville-Bennion ID	D-IV
Ferrel, Susan S.	Metropolitan WD of SLS	T-IV
Fisher, Lance R.	Taylorsville-Bennion ID	D-IV
Flanary, Bruce C.	Centerville City	D-I
Flanders, Bill	West Bountiful City	D-IV
Fleming, Daniel A.	Blanding City	D-IV, T-IV
Fluckey, Gary L.	Green River City	T-IV
Folkman, Lee G.	Weber Basin WCD	D-IV, T-III
Forbes, Kerry L.	Bountiful City	D-IV
Foreman, William C.	Canyonlands/Maze District	D-I
Forster, Neil R.	Water Specialist	D-IV
Fulgham, Paul C.	Tremonton City	D-IV
Fulton, Stephen C.	Roy City	D-IV
Gale, Troy A.	Questar Pipeline	T-I
Gallegos, Albert A.	US Magnesium LLC	D-II, T-III
Gardner, Chris J.	Logan City	D-III
Gardner, David A.	Draper Irrigation Company	T-IV
Gaylord, Edward A.	Watson Shelter	D-II
Gee, Martha J.	Mountain Regional Water	D-III
Gillins, David A.	Brianhead Town	D-II
Glazier, Jay A.	Park City	D-III
Gonzales, Clarence L	US Magnesium LLC	D-II, T-III
Goodrich, Jerry W.	Tridell-LaPoint WID	D-III, T-III
Goodsell, Terry L.	Newton Water System	D-I
Gordon, Todd R.	Salem City	D-II
Grammer, Brad C.	Central Utah WCD	T-IV
Gray, Lane D.	Orem City	D-IV
Green, Duane C.	Riverton City	D-IV
Green, Michael E.	Pleasant Grove City	D-III
Gregory, Dan S.	Glen Canyon Hite Marina	D-II, T-II
Grimsdell, Jeffrey L.	Salt Lake City	D-IV
Grover, Kevin L.	Tooele City	D-II
Grundy, Stanley R.	Jordan Valley WCD	D-IV
Guard, Troy T.	St George City	D-IV
Gubler, Douglas	LaVerkin City	D-III
Gunderson, Jared D.	Hyrum City	D-IV
Gunter, Ray L.	Price River WID	D-IV
Guymon, Hank O.	Granger-Hunter ID	D-IV

Haas, Merrill A.	Orem City	D-IV
Hall, Gary L.	Price River WID	D-IV
Hall, Gary M.	Kanab City	D-III
Hans, Paul D.	Springdale Town	T-I
Hansen, Douglas A.	Holliday Water Company	T-IV
Hansen, Edwin J.	Magna Water Company	D-IV
Hansen, Garrett L.	Castle Valley SSD	T-II
Hansen, Loay R.	Logan City	D-II
Hansen, Lon H.	Roy City	D-IV
Hansen, Mark E.	Ogden City	T-IV
Hansen, Michael V.	Mapleton City	D-II
Hanson, Keith J.	SL County Service Area #3	T-IV
Harold, Philip D.	Genola Town	D-I
Harris, Dale E.	Springdale Town	T-II
Harwood, Gary R.	Helper City	D-III
Haslam, John S.	Salt Lake City	T-IV
Hatch, David L.	Ashley Valley W&SID	D-IV, T-IV
Hatch, Ray M.	Centerville City	D-I
Hatch, Roger K.	Central Utah WCD	D-III
Hatfield, Richard R.	Springville City	D-I
Hawkinson, Larry E.	Green River City	T-III
Hilbert, R. Jeffrey	Jordan Valley WCD	D-IV
Hilbert, Richard W.	Park City	T-II
Hill, Tracy L.	Provo City	D-IV
Hills, Kim	Salt Lake City	T-III
Hindes, Robert W.	Clearfield City	D-III
Hobbs, Steven S.	Utah State University	D-IV
Hodson, Keith D.	Clearfield City	D-III
Hodson, Paul A.	Bona Vista WID	D-IV
Holdaway, Brad K.	Central Utah WCD	D-IV, T-IV
Holley, Janice J.	Provo City	D-IV
Hooton, Leroy W. Jr	Salt Lake City	T-IV
Horrocks, Ronnie N.	Heber City	D-III
House, Brian R.	Bear Lake State Park	D-I, T-I
Howard, Matthew L.	Roy City	D-IV
Huggard, Don A.	Midway City	D-III
Hunter, Donald M.	Water Specialist	D-II
Hunting, Terrill W.	Central Utah WCD	D-IV, T-IV
Hughes, Brian R.	North Salt Lake City	D-IV
Huntington, Royal M	Castle Valley SSD	D-IV
Hutcheon, A. Jack	Taylorsville-Bennion ID	D-IV
Hutchings, Larry	Hurricane City	D-III
Israelsen, Harold J.	Weber Basin WCD	T-IV
Jackson, Kenneth A.	Holden Town	D-I
Jeffs, Charles E.	Water Specialist	D-IV, T-IV
Jerominski, Paul E.	Park City	T-III
Jessen, Dallan J.	Harmony Heights Water Co	D-I
Jessen, Darrow H.	Harmony Heights Water Co	S-S
Jessop, Dan O.	Kaysville City	D-IV
Jessop, Loyd Y.	Washington Co - Cottam	D-II
Johnson, James Q.	Logan City	D-III
Johnson, Rick B.	South Ogden City	D-II
Joliet, Joseph E.	Water Specialist	D-II
Jones, Brad L.	Logan City	D-IV
Jones, Lorin V.	Veyo Culinary Water Assn	D-II
Jones, Stephen C.	Orem City	D-IV
Jones, Zane T.	Cedar City	D-IV
Jordan, Linda L.	Deseret G&T	T-II
Keeler, Steve E.	Dixie Deer SSD	D-IV

Keers, Peter T.	White City WID	T-III
Kell, Lee Frank	St George City	D-IV
Kennedy, Ronald E.	Castle Valley SSD	D-IV, T-IV
Kertamus, R. Joel	Grantsville City	D-III
Kesler, Larry D.	South Jordan City	T-I
Kimball, Richard J.	Metropolitan WD of SLS	D-IV
King, Jeffrey L.	Jordan Valley WCD	T-IV
Knop, Michael E.	Castle Valley SSD	D-IV
Kofford, Danny T.	Price River WID	D-IV
Kopfman, William R	Water Specialist	D-IV, T-IV
Larsen, Dean L.	US Forest Service	D-III
Larsen, Max L.	US Forest Service	D-I
Leatham, George B.	Saratoga Springs	D-IV
Lofley, Blane D.	Castle Valley SSD	T-III
Lofley, Keith	Castle Valley SSD	D-III
Lovato, Sam D.	Centerville City	D-II
Love, G. Sullivan	Orem City	D-IV
Mason, George R.	Cross Hollow Hills Subdiv	S-S
Massey, Flayne	Jensen WID	D-II
Matheson, Jeffery E.	Metropolitan WD of SLS	T-IV
Mathis, Rex B.	Central Utah WCD	D-IV
Matthews, Kipp M.	Sandy City	D-IV
Maxwell, Ben A.	Logan City	D-II
McClellan, Clark L.	Central Utah WCD	D-IV, T-IV
McNeil, Larry D.	Cedar Breaks NM	D-I
McPhie, Bret L.	Water Specialist	D-III
McPhie, Tim J.	Twin Creeks SSD	T-II
Millard, Steve E.	Salt Lake City	D-IV
Miller, Alan W.	Water Specialist	D-IV
Miller, John B.	Herriman Pipeline Co	D-II
Miller, Michael D.	Salt Lake City	T-IV
Mitchell, Duane C.	Metropolitan WD of SLS	D-IV
Mitchell, Kenneth G	Park City	D-IV
Mitchell, Preston Jay	Roosevelt City	D-III
Mitchell, Ronald	Central Utah WCD	D-IV
Morganson, Tracy	Taylorsville-Bennion ID	D-IV
Morris, Robert A.	Water Specialist	T-III
Morzelewski, David	Bountiful City	T-IV
Moss, Linda R.	Salt Lake City	T-IV
Myers, Kurt R.	Central Utah WCD	T-IV
Naranjo, Michael J.	Layton City	D-IV
Nelson, Paul W.	Perry City	D-II
Nelson, Robb D.	Orem City	D-IV
Nephi, Stacey	Ute Tribe Domestic Water	D-III
Nielsen, Corey W.	Hyrum City	D-III
Nielsen, Dennis M.	Taylorsville-Bennion ID	D-IV
Nielsen, Floyd J.	Taylorsville-Bennion ID	D-IV
Nielsen, Jeff L.	Fountain Green City	D-I
Nielson, Jerry O.	Draper Irrigation	D-IV
Nylander, Jerry A.	Weber Basin WCD	T-IV
Ohler, Brian R.	Deseret G&T	T-IV
Orchard, Theo R.	Orem City	D-IV, T-IV
Paddock, Shane D.	Jordanelle SSD	T-IV
Parnell, Jim E.	Leeds Domestic Wtr Users	D-I
Paxman, Scott W.	Weber Basin WCD	T-IV
Payne, Roger L.	West Jordan City	D-IV
Pedersen, Rex M.	Jordanelle SSD	D-III
Pendleton, Keith B.	St George City	D-II
Perkins, Shane F.	Logan City	D-II

Petersen, Ben L.	Orem City	D-IV
Peterson, Ernest K.	Erda Acres Water Company	D-I
Peterson, John L.	Jordan Valley WCD	D-IV
Pettingill, Timothy	Centerville City	D-I
Phan, An	Salt Lake City	T-IV
Phung, Viet Van	Jordan Valley WCD	T-IV
Piker, Tanya	Water Specialist	T-I
Pitcher, David O.	Central Utah WCD	T-IV
Potts, Dennis A.	Salt Lake City	T-IV
Prince, Robert L. Jr.	Ogden City	D-IV
Pugsley, Tyler D.	Water Specialist	D-III
Pyne, Roger L.	Orem City	D-IV
Raber, Robert W.	Salt Lake City	D-IV
Reynolds, Casey J.	Rocky Ridge Town	D-I
Rice, Kenneth C.	Metropolitan WD of SLS	D-IV
Ricketts, Scott R.	Washington Terrace City	D-II
Riding, Alan K.	Delta City	D-IV
Roberts, John W.	Water Specialist	D-II
Robinson, Gerri L.	Ogden City	D-II
Robinson, Keith	Kanab City	D-III
Rochell, Paul R.	West Point City	D-II
Rogers, William J.	Daggett County	T-I
Sabey, James Edd	Wasatch County	T-II
Sabey, Rick C.	Orem City	D-IV
Sabuco, Francisco C	Metropolitan WD of SLS	D-IV
Samul, James A.	Salt Lake City	T-IV
Santistevan, Chris A	Riverton City	D-IV
Sayers, Richard L.	Sandy City	D-IV
Schulze, Donald L.	Golden Spike NM	D-I
Scow, Gary W.	Price River WID	D-IV
Seamons, Brent N.	Mapleton City	D-II
Searcy, Dale K.	Roy City	D-IV
Shafer, Robert D.	South Ogden City	D-IV
Sharp, Haskell L.	Hill Air Force Base	D-III
Shaw, Cary D.	Jordan Valley WCD	D-IV
Shaw, Thomas A.	Jordan Valley WCD	T-IV
Shields, J. Robert	Stansbury Park ID	D-II
Shiner, Terry C.	Vernal City	D-I
Shinsel, Troy H.	Water Specialist	D-IV
Simons, Bart	Provo City	D-IV
Skoubye, David E.	Metropolitan WD of SLS	T-IV
Slade, Karl R.	Taylorsville-Bennion ID	D-IV
Slagowski, Mark E.	Bountiful City	D-IV
Smith, Gordon L.	Metropolitan WD of SLS	D-II
Smith, Jerry B.	Taylorsville-Bennion ID	D-IV
Smith, Lonnie M.	Layton City	D-IV
Smith, Terry K.	Cedar City	D-IV
Snook, Kenneth Jr.	Price River WID	T-IV
Solomon, Phillip T.	St George City	D-IV, T-III
Sorensen, Val W.	Water Specialist	D-I
Spackman, David A.	Jordan Valley WCD	T-IV
Spackman, Michael	Draper City	D-II
Stahler, Steven E.	Layton City	D-IV
Stock, Ronald A.	Taylorsville-Bennion ID	D-IV
Stock, Vernon Dean	South Salt Lake City	D-IV
Stokes, Clark J.	Energy West Mining Co	T-II
Stokes, Danny J.	Ogden City	D-IV
Stone, Jed L.	Cottonwood Hospital	D-II
Stringham, Daniel D	Laketown	D-I

Sulser, Kirk L.	Heber City	D-III
Sundberg, Marlin K.	Holliday Water Company	T-IV
Tabish, Robert J.	Sandy City	D-IV
Taveapont, Don C.	Ute Tribe Domestic Water	T-I
Taylor, Marvin R.	South Salt Lake City	D-IV
Thackeray, Alan R.	Jordan Valley WCD	D-IV
Thayn, Randy R.	Energy West Mining Co	T-II
Thayne, Gordon E.	Orem City	D-IV
Thomas, Michael L.	Dixie Deer SSD	D-IV
Thompson, Mark S.	Highland Water Company	D-III
Tietje, Matthew J.	Metropolitan WD of SLS	D-IV
Tingley, Rodney S.	Hill Air Force Base	D-II
Tolman, Douglas R.	Honeyville City	D-II
Townes, Linda F.	Jordan Valley WCD	D-IV
Trimble, Johnny D.	Jordan Valley WCD	D-IV, T-IV
Twitchell, Kenneth	Salt Lake City	D-IV
Vigil, John A.	Midvale City	D-II
Wall, Shawn R.	Magna Water Company	D-IV
Warner, William A.	Jordan Valley WCD	D-IV
Washburn, Kevin E.	Canyon Fuel, Skyline Mine	D-IV
Waters, John A.	Spanish Fork City	D-III
Weaver, William C.	Water Specialist	D-III
Webb, Sherman M.	Central Utah WCD	T-IV
Weech, Travis K.	Jordan Valley WCD	D-IV
Welder, Paulette D.	Ashley National Forest	T-I
Wells, Cory L.	Murray City	D-IV
Wheeler, Claudia	Metropolitan WD of SLS	D-IV
Whipple, Thomas R.	Alta Ski Lifts	D-II
White, Stanley J.	Glen Canyon Hite Marina	T-II
Whittle, Deon E.	Jordan Valley WCD	D-IV
Wilding, David M.	Bountiful City	D-IV
Wilhelm, Robert K.	North Logan City	T-III
Wilkinson, Arlon R.	Salt Lake City	D-IV
Wilkinson, Wayne	Wilkinson Water Company	D-I
Williams, Allen D.	Monroe City	D-II
Williams, Brent R.	Magna Water Company	D-IV
Williams, Kenneth E	Centerville City	D-IV
Wilson, Michael L.	Metropolitan WD of SLS	D-IV
Wood, Larry D.	East Carbon City	T-II
Woodruff, Fred W.	Water Specialist	D-II
Wright, Douglas J.	South Salt Lake City	D-IV
Wright, Kurt A.	National Park Service	D-III
York, Ryan W.	Provo City	D-IV
Young, Ronnie L.	Myton City	D-I
Zampedri, Timothy	South Ogden City	D-II

Lapsed Certificates - An operator who fails to renew his/her certificate by the expiration date may consider applying for reinstatement. According to the State of Utah Operator Certification Rules, "A lapsed certificate may be renewed within six months of the expiration date, by payment of the reinstatement fee or passing an examination. After the first six months from the expiration date, the operator shall have one year to appeal to the Operator Certification Commission for renewal of the certificate. After considering the training, experience, education and progress made since the certificate lapsed, the Commission may grant reinstatement without examination." ■

2003 Certification Exams

Attention all water system operators and managers, and anyone seeking employment in the water industry. The Division of Drinking Water (DDW) is offering operator certification exams for water distribution and water treatment systems. All grade levels, including small systems, will be offered on **September 19, 2003,** and **November 7, 2003**.

Operator Certification Exam Schedule

	Exam date: **September 19, 2003** Exam time: 9:00 a.m. Application deadline: September 5, 2003	Exam date: **November 7, 2003** Exam time: 9:00 a.m. Application deadline: October 17, 2003
EXAM LOCATION	Yarrow Hotel and Conference Center 1800 Park Avenue Park City, Utah 84060 (For room reservations call 800-927-7694. Discount rate of $79.00 per night till August 25, 2003, if you mention the conference.)	16 locations in Utah. See exam application for list of cities.
EXAMS OFFERED	▪ Small System ▪ Distribution (grades I through IV) ▪ Treatment (grades I through IV)	▪ Small System ▪ Distribution (grades I through IV) ▪ Treatment (grades I through IV)
SPONSOR INFORMATION ► To obtain conference registration forms, contact the Rural Water Assn. of Utah ► To obtain exam applications, contact the Division of Drinking Water	**TO REGISTER FOR THE CONFERENCE OR THE TRAINING COURSE**, send the registration form and fee to: Rural Water Association of Utah 76 E. Red Pine Drive Alpine, Utah 84004 Telephone: (801) 756-5123 Fax: 801-756-5036 E-mail: smcomber@rwau.net For more information about registration and fees, please contact the RWAU. **TO APPLY FOR THE EXAM**, send application and fee to: Division of Drinking Water Operator Certification Program 150 North 1950 West P.O. Box 144830 Salt Lake City, Utah 84114-4830 Telephone: (801) 536-4200 Fax: 801-536-4211 E-mail: mhand@utah.gov	**TO APPLY FOR THE EXAM**, send application and fee to: Division of Drinking Water Operator Certification Program 150 North 1950 West P.O. Box 144830 Salt Lake City, Utah 84114-4830 Telephone: (801) 536-4200 Fax: 801-536-4211 E-mail: mhand@utah.gov

The **SEPTEMBER 19, 2003,** exam will be held in Park City in conjunction with the Rural Water Association of Utah (RWAU) summer training conference scheduled September 16-19, 2003. To help

prepare applicants for the certification exam, RWAU has included a three-day pre-exam training course in their conference program. The training will run from Tuesday, September 16, to Thursday September 18.

► Important: If you are registered to take the RWAU training course, and wish to take the certification exam on Friday morning, you must submit an exam application to the Division of Drinking Water office by Sept. 5, 2003.

RWAU staff members will proctor the exam on Friday morning, September 19. The exam will begin at 9:00 a.m. You will be given three hours to take the exam. The exam will consist of 100 multiple-choice questions covering safety, math, chlorination, state rules, pumps and pumping, and operation and maintenance. A minimum score of 70% is needed to pass the exam.

Note to operators preparing for the exam: Although the State Division of Drinking Water is offering all grade levels, the RWAU training is specifically directed toward small systems and grade level one. Because of the wide range of knowledge needed for all exams, you should come to the training course prepared to take the exam. The training will be beneficial to everyone, but should be used more as a refresher course for your pre-study preparation.

The **NOVEMBER 7, 2003,** exam will be offered at 16 locations throughout the state (see exam application for list of cities). The exam will begin at 9:00 a.m. at all locations. You will be given three hours to take the exam. The certification exam will consist of 100 multiple-choice questions covering safety, math, chlorination, state rules, pumps and pumping, and operation and maintenance. A minimum score of 70% is needed to pass the exam.

HOW TO APPLY FOR THE EXAM . . .

Fill out the exam application completely and mail it, along with the appropriate fee, to: Division of Drinking Water, Operator Certification Program, 150 North 1950 West, P.O. Box 144830, Salt Lake City, Utah 84114-4830. Make the check or money order payable to the ADivision of Drinking Water.≅

Record Application Fee (for first-time applicants who have never before taken an exam) $20.00
Examination Fee $50.00

Note: If you have taken an operator exam in the past, you need only pay the $50.00 exam fee.

The exam application and fee must arrive at the Division of Drinking Water office on or before the deadline listed. Applications and fees received after the deadline will not be accepted. All exam applicants will receive a confirmation letter. If you do not receive your confirmation letter, please contact the Operator Certification Program staff immediately.

Exam Cancellation Policy: Only one cancellation, per applicant, is allowed. An applicant making a written or phone-in cancellation by 9:00 a.m. on the day of the exam may request a refund of the exam fee or take the next scheduled exam. If the applicant should also cancel the next scheduled exam, the exam fee will be forfeited.

Exam applications are available at the Division of Drinking Water office or at the website. Blank applications may be photocopied. For more information feel free to contact the Operator Certification Program staff. ■

Division of Drinking Water

Operator Certification Program
150 North 1950 West
P.O. Box 144830
Salt Lake City, Utah 84114-4830
Telephone: (801) 536-4200
Fax: 801-536-4211
E-mail: mhand@utah.gov OR kdyches@utah.gov
Website: http://drinkingwater.utah.gov

How to Become a Certified Water Operator

If you are an individual looking for employment within the drinking water industry in Utah, or if you are interested in becoming a Awater specialist,≅ you may apply for certification. There are only two ways to become a certified operator in Utah:

- By taking a Utah operator certification written or oral examination.
- By applying for reciprocity if you are certified as an operator in another state.

Certification is divided into two disciplines: Distribution and Treatment. There are five grade levels within the distribution discipline: Small System and Grades I thru IV. There are four grade levels within the treatment discipline: Grades I thru IV.

Detailed Breakdown of Exam Subject Coverage - The exams offered in water treatment and distribution can be categorized according to the level of ability and competency of the operator expected to take these exams. Any operator who makes independent decisions that affect the sanitary quality, safety, and adequacy of the water to their system will need to be certified to the grade level of the system.

Small System - This level is for persons running a very small system with a population of 25-500. A volunteer or elected official usually runs these community or nontransient noncommunity systems.

Grade I - This level is for persons running small systems or slow-sand filter, reverse osmosis, or similar types of small treatment facilities*. The operator at this level in a larger system will generally be closely supervised.

Grade II - This level is for persons running a system with a population of 1,500 to 5,000, or small package-type treatment plants*. This corresponds to a Alead≅ level position. Through experience and education, the operator has demonstrated himself independently competent in most basic tasks.

Grade III - This level is for persons running a system with a population of 5,000 to 20,000 or medium size treatment plants*. This corresponds to a Ajourneyman≅ level position and the person generally supervised and instructs others. They can, without direct supervision, operate and maintain all but the most complex systems.

Grade IV - This level is for persons running a system serving over 20,000 population or large treatment plants or plants with complex operational processes.* This level corresponds to the highest level currently available under the Utah program. It identifies that the person has demonstrated knowledge of the most complex portions of water system operation. The Grade IV operator routinely supervises work crews or groups of work crews. Budget preparation is frequently a duty. It is assumed that a person certified at this level has enough experience and education to operate any other water system

serving more than 20,000 people, in compliance with the Utah Public Drinking Water Rules and laws of the state of Utah. ■

**Treatment plants are rated on population served, degree of treatment, and complexity of operational processes.*

The State of Utah Operator Certification Rules state that "Every community and nontransient noncommunity drinking water system and all public systems that utilize treatment of the drinking water shall have at least one operator certified at the classified grade of the water system. Certification must be appropriate for the type of system operated (treatment and/or distribution)."

Introducing the Division of Drinking Water's Newest Professionals . . .

MARK FOSTER
Environmental Engineer

Mark has been with the Division of Drinking Water since October 2002. He is working with Ken Wilde in the State/Federal Revolving Fund and Federal Grant programs. His duties focus on assisting loan applicants with processing their applications, which includes such things as reviewing and assisting with development of user rates, Water Conservation Plans, Environmental Assessments (EAs), construction schedules, attending public meetings for discussion of the EAs, reviewing construction payment requests and change orders. He is also responsible for managing the MBE/WBE (minority business enterprise/woman-owned business enterprise) requirements of the program.

Mark is also responsible for performing some annual sanitary surveys.

Past work experience has included 18 years in consulting and 2 years in prior state service. Mark's consulting experience has included design and project management of water distribution and storage systems, subdivision engineering, highway and signal design, underground storage tank program management and NEPA program management. His prior state service was at UDOT as a region construction engineer.

Mark graduated from BYU in civil engineering and, in order to seem impartial, has attended graduate classes in structural, transportation and environmental engineering at BYU, U of U, Utah State, UCSB (Santa Barbara), Cal State Long Beach, and UNLV.

His hobbies include water skiing and boating, hiking, camping, running, mountain biking, gardening, reading and watching cartoons with his kids.

BOB HART
Environmental Engineer

Bob Hart joined the Division of Drinking Water in November 2002 as an environmental engineer. His job duties include implementing the Surface Water Treatment Rule and the recent additional

treatment rules that have been or will be promulgated. In addition he will do plan reviews of new or modified systems and sanitary surveys.

Bob has a Masters Degree in Chemical Engineering from the University of Idaho. He worked for 15 years for FMC Corporation's Elemental Phosphorus plant in Pocatello where he gained experience in wastewater treatment and environmental compliance.

Bob was born and raised on a farm and cattle ranch in Idaho where he learned a love for the outdoors and agriculture. He looks forward to meeting and working with more people from the drinking water industry in the state of Utah.

MIKE JOHANSON
Environmental Scientist

My responsibilities with the State include the Surface Water Treatment Rules and the Disinfection Byproducts Rule. This includes verifying compliance and training water system personnel on new rule changes, among other things.

I have been working in the water industry for almost six years now with the majority of that time being employed by Salt Lake City. I worked at the Big Cottonwood Water Treatment Plant for five years as an operator involved in all aspects of water treatment. Big Cottonwood W.T.P. is a conventional treatment plant using Alum and Ferric as primary coagulants with a maximum flow of 42 MGD.

I came to work for the State at the end of 2002. I have a B.S. degree in chemistry from Southern Utah University with one year completed towards a Master's degree in Environmental Engineering at the University of Utah. I have my Grade 4 certification in water treatment and distribution, along with Grade 4 certification in wastewater treatment.

I am married with two children and enjoy a variety of activities in my free time including music, reading, sports, and spending time with my family.

NATHAN LUNSTAD, P.E.
Environmental Engineer

Nathan Lunstad joined the Division of Drinking Water in December 2002 and is a Professional Engineer in the Engineering Section. Nathan received his Bachelor and Master of Science Degrees from Brigham Young University in 1995 and 1997. Prior professional experience includes work at CH2M Hill and MWH - Montgomery Watson Harza.

Nathan's main responsibilities are to review plans and specifications for public drinking water projects to assure good engineering design and conformance with state regulations. Nathan will also perform construction inspections and sanitary surveys on public drinking water systems.

JOHN OAKESON
Environmental Scientist

We welcome John Oakeson to the staff at the Division of Drinking Water. He has worked in the water profession for almost 33 years.

Before coming to the Division John worked for Sandy City public utilities. He started with the City in 1970. He had a varied career with Sandy City. He began as a construction and maintenance worker for

the water department and eventually directed the field construction and maintenance crews. In 1980, he became water distribution supervisor. John was responsible for the day-to-day operations of the water distribution system. He took over the responsibility of developing and administering water system sampling and source monitoring programs. As the City grew, John was given the departmental assignment of training and compliance manager. He continued to oversee the water sampling program. He developed and administered the City's cross connection control program. He was also responsible for department training and safety programs. He retired from the City last November as assistant operations manager.

John is a Class 3 backflow technician. He is certified as a grade 4 water operator in both treatment and distribution. He serves on the board of directors for the Intermountain Section of the American Waterworks Association. He has been involved with water operator training around the state for many years. He served on the Utah Operator Certification Commission for five terms. John is a member of the Intermountain Section of the American Waterworks Association Small Water Systems Committee. John is also active in the Utah Chapter of the American Backflow Prevention Association.

John and his wife, Deb, live in West Jordan. They enjoy spending time on their ATVs and camping with their family. They have two married daughters and one grown daughter still living at home. ■

Division of Drinking Water
Staff Directory

Mission Statement: "To protect the public against waterborne health risks through assistance, education and oversight."

Location and mailing address:
Division of Drinking Water
Operator Certification Program
150 North 1950 West
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Salt Lake City, Utah 84114-4830

How to contact us:
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E-mail: mhand@utah.gov
Website: http://drinkingwater.utah.gov

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The *OpenLine* newsletter is published on a yearly basis. The articles center around water system operators and managers.

Correspondence or contributing articles may be submitted to the Division of Drinking Water, Operator Certification Program.

Questions or comments? Please contact:

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A hard copy of the *OpenLine* newsletter, produced and printed by *Artistic Printing* of Salt Lake City, Utah, may be obtained by contacting the Operator Certification Program staff.