

UTAH GROUND WATER ADVOCATE

SPRING 2009 EDITION



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Message from the President

WHY BE A MEMBER OF THE UGWA?

RICHARD PETERSEN

Over the last several months I have been asked the question why become a member of the UGWA? This has caused me to reflect on why I became involved in both the UGWA and the NGWA. I was first invited by Steve Anzalone. My father had gone years ago and was very disappointed. I mention this because we were working together and were invited at the same time. But after talking with Steve we decided to try it once it was in St George.

One of the first things we noticed was the scholarship fund and thought what a good thing for the youth and decided if this organization was doing these kinds of things our \$50.00 per year was well spent. Like most well drillers we were very independent and very concerned about anyone telling us how to drill and what to do. But almost at the very first I noticed something about what was being said and what was not said.

Rules and Laws were being made whether or not we participated and at first I think I felt the same as a typical well driller. Who was ever going to find me drilling in the southern Utah area and tell me how to drill a well? And then a few years went by and rules started to change that did find me and then came CEU's and I jumped up and down with everybody. Then after a while I thought about the reason I had started with the NGWA, I was tired of that old BS I had been getting from the rest of the industry "You're just a well digger what do you know?" It was through the CEU's at the NGWA I was able to counter them with truly how little they knew.

MESSAGE FROM THE PRESIDENT (CONTINUED)

WHY BE A MEMBER OF THE UGWA?

RICHARD PETERSEN

It is like each section of our industry speaks a different language and as I learned more of theirs I was able to teach them and learn from them how to come together with respect for each others different needs to complete a project that's data could be shared with all those who might need or have use for it to make the future better.

So after the opportunity for scholarships for your family, the ability to share with those you have a lot in common with, the training on new products, are the number one reasons for me. As a group our ideas about our industry should count, but as drillers all alone right or wrong most people and more importantly our regulators don't give a crap what we think. We must come together and stick together if we are to survive as small independent drillers or we will be totally run out. So bottom line even if you are not into being in meeting after meeting your membership means you are there. It may not mean you will always agree but at least they know you are there and you are watching.

I have been a member of the NRA for years for one reason, they fight to keep as many of my freedoms as possible. That doesn't always mean I agree with them every time they speak, but government knows when they speak they better think before they vote or they might be out looking for work with me. That's why I think every driller, pump installer, engineer, hydrologist, and geologist that works in our field in Utah should be a card carrying member of the UGWA and that is what I am working for.

May you all leave the finest water producing wells possible and may god watch over all of you and your families and loved ones.

Richard Petersen
President

: **If you are interested in becoming a member of** :
: **the UGWA please contact Colette Read at 801-** :
: **541-7259 or fill out the attached application** :
: **(next page) and send to the attention of** :
: **Colette Read at:** :
: **5577 Walden Glen Drive** :
: **Murray, Utah 84123** :
: -----

UTAH GROUND WATER ASSOCIATION Membership Application

Please Complete and Mail with your \$50 Payment to: UGWA—5577 Walden Glen Drive, Murray UT

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REPRESENTATIVE _____

COMPANY ADDRESS _____

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Membership Types

- A. **CONTRACTOR:** Any person, firm or corporation doing business and licensed to drill, either water wells or ground water monitoring.
- B. **MANUFACTURER:** Any person, firm or corporation engaged in the manufacturing of equipment, or materials used in the ground water industry.
- C. **SUPPLIER:** Any person, firm or corporation engaged in the sale of equipment or supplies associated with the ground water industry.
- D. **TECHNICAL:** Any hydrologist, geologist, ore engineer involved in teaching, research, consulting and or government services associated with the ground water industry.

This membership allows the joining one representative and spouse/partner of a firm or corporation to benefit from all the privileges of membership in the Utah Ground Water Association. All membership dues are \$50.00 per year, with the year running from February to February. These dues cover membership only in the Utah Ground Water Association. The Utah Ground Water Association is affiliated with the National Ground Water Association and the Mountain States Ground Water Association.

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Charlie Eppler



Charlie Eppler 3/23/1944 ~ 4/4/2009 Charlie Eppler passed away unexpectedly, surrounded by his family at Central Valley Medical Center. Survived by sons Vince (Susan) Eppler, Angel Fire, NM; Kurt (Renita) Eppler, Angel Fire, NM; Clint (Ellen) Dye, Levan, UT; and daughter Betty (Tom) Aust, Levan, UT; 11 grandchildren, seven great-grandchildren; sisters Betty (Byron) Calcote, Elizabeth Cook. Preceded in death by his wife Marsha Eppler, dad Audrey Eppler and mother Myrtle Eppler. He will be remembered for his generosity, work ethic, dedication for his family, drilling and story telling. His interests were hunting, fishing, raising and feeding wild turkeys, chickens, and spending time with his best friend Scratchy (his dog). He raised four children and owned and operated Midway Perforating & Drilling Inc. Funeral services will be held Thursday, April 9, 2009 in the Wales LDS church at 12 noon. Visitation prior to the service from 10:30-11:30 a.m. Interment in the Wales Cemetery. As Charlie requested there will be a potluck dinner after the services at his home. All family and friends are invited to come and celebrate his life. Online condolences available at rasmussenmortuary.com.

If you would like to receive hard copies of the Newsletter consider joining the UGWA. As a member you will be entitled to receive the quarterly Groundwater Advocate, participate in the scholarship program, and become part of an organization of your peers.

If you are already a UGWA member and would like to begin receiving the newsletter in PDF format via e-mail, please contact Colette Read at colette@xmission.com.

NEWS FROM THE STATE ENGINEER'S OFFICE

JIM GODDARD

Utah Division of Water Rights Well Drilling Program

Continuing Education Update

The continuing education (CE) requirements in the Well Drilling Rules have been in place for just over 8 years. Over this time, the Division of Water Rights has observed an enhancement in the quality of well construction, improvement in the compliance of well drilling rules, as well as an increase in communication and cooperation between the Division and licensed drillers. The Division recently evaluated where licensed drillers were obtaining their CE credits for license renewal. The following list provides a percentage breakdown of CE provider distribution:

UGWA Mesquite Convention	32%
Water Rights annual SLC Seminar	27%
Local Suppliers/Manufacturers	10%
UGWA Moab Seminar	9%
Other State Associations	6%
NGWA Convention	5%
Mountain States Convention	5%
Safety/First Aid/CPR training	5%
Online Education	1%

Driller License Renewal Information

Licensed drillers whose last name begins with A-L (and their registered operators) are required to renew this year by the end of June. Renewal packets will be sent out to licensed drillers by the first part of May. With regard to CE documentation, the Division has record of those attending UGWA Mesquite, UGWA Moab, and Water Rights SLC Seminar, and drillers need only to list their attendance to these classes on the renewal application without submitting separate CE documentation. The 2009 Water Rights Seminar will be held on June 18th this year in SLC. A total of 6 CE credits will be available at this seminar. More details regarding the agenda and location of this seminar will be provided in the renewal packet. The new State Engineer/Division Director, Kent L. Jones, P.E., will be the keynote presenter at this seminar.

During the 2009 legislative session, the Utah State Legislature increased all Division of Water Rights fees, including those fees for driller and operator licensing and renewal. The following list provides a breakdown of the new fee structure, which will go into effect on July 1, 2009.

New Driller License	\$350
New Operator Registration	\$100
Driller License Renewal	\$100
Operator Registration Renewal	\$50
Late fee	\$50

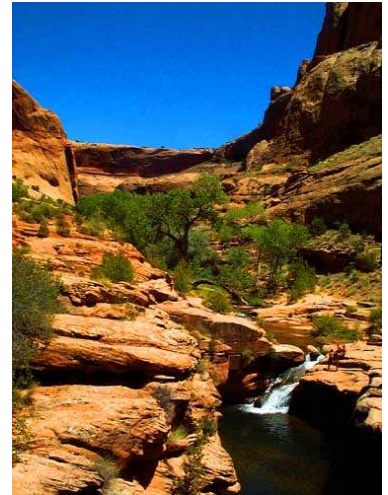
Continued on Page 8

MOAB WATER WELL CONVENTION

MAY 15, 2009

At the

La Quinta Inn
815 S Main St
Moab, Utah
435-259-8700



Room Rate \$105/night

Last day to get discounted room rate is May 4th

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Jim Goddard, UDWR
Utah Highway Patrol
Western Hydro
And Others

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435-686-2294 or
e-mail Maryanna at zimmermandrlg@frontiernet.net

NEWS FROM THE STATE ENGINEER'S OFFICE

JIM GODDARD (CONTINUED FROM PAGE 6)

Utah Division of Water Rights Well Drilling Program

If only for this upcoming renewal cycle, drillers and operators who submit their completed renewal applications before July 1, 2009 will only need to pay the current \$25 renewal fee. Applications submitted after that date will require the new fee as well as the new late fee.

Administrative Rules for Water Well Drillers

The Administrative Rules for Water Well Drillers (Rule R655-4) were revised and updated in September of 2008, and a new Water Well Handbook was published and distributed to licensed drillers. The new 2008 version of the handbook has a bright yellow cover and supersedes the 2004 version of the handbook with the orange cover. Please rely on the 2008 handbook for application of well drilling rules and discard or archive any previous versions of the handbook.

The new Water Well Handbook includes the recently revised administrative rules and construction standards for water well drillers. The handbook also contains other helpful information including contact information for Water Rights staff, an appendix describing the well drilling authorization approval process, and appendix containing selected water laws that pertain to well drilling, and an appendix describing well drilling reporting instructions. Copies of the handbook can be obtained from the Division of Water Rights' Well Drilling Program or a PDF version of the rules can be downloaded from the "Wells" page of the Water Rights Website (www.waterrights.utah.gov). The most substantive 2008 changes to the Rules are summarized below:

- Clarification on the type of wells and activities that are regulated by the Well Drilling Rules (R655-4-1)
- Clarify regulated activities to include: drill, construct, deepen, repair, renovate, clean, develop, abandon, and replace.
- Define test wells and piezometers as regulated wells
- Define other wells such as inclinometers, horizontal utility wells, structure monitoring wells, dewatering wells as regulated
- Define exempt status of oil, gas, and mineral exploration/production wells
- Additions and modification to Definitions (R655-4-2)
- Abandoned Well (clarified)
- Annular Space (clarified)
- Aquifer (clarified)
- Dewatering Well (new)
- Gravel Packed Well (clarified)
- Grout (clarified)
- Hydraulic Fracturing (clarified)
- Piezometer (new)
- Provisional Well (clarified)
- Public Water System Supply Well (clarified)
- Pumping Water Level (clarified)
- Test Well (new)
- Watertight (new)
- Well Drilling (clarified)

Continued on Page 10

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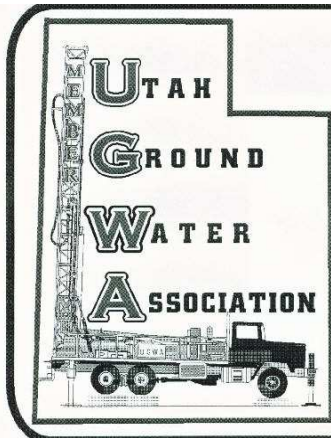
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NEWS FROM THE STATE ENGINEER'S OFFICE

JIM GODDARD (CONTINUED FROM PAGE 8)

Utah Division of Water Rights Well Drilling Program

- Clarification of the amount and type of experience needed to obtain a well driller's license (R655-4-3.2.4)
 - Water wells – 2 years or 16 wells
 - Monitoring wells – 2 years or 32 wells
 - Other non-production wells – 6 months and 16 well projects
 - Related education can be used for up to 25% of required experience.
- Clarification that a driller license can be revoked if it is determined that original license application was falsified (R655-4-3.6).
- Requirement to update the start date on a start card if a project is delayed (R655-4-4.2.4)
- Clarification on conditions for issuing a cease and desist order (R655-4-4.3.5)
 - Violation of construction standards
 - Using a drilling method not authorized on a license
 - Using an incompetent registered operator
 - Drilling without a license or registration
- Stipulate that driller should research/investigate drilling conditions prior to starting (R655-4-4.3.8)
- Stipulate that a driller must receive a variance to remove a rig from an uncompleted well (R655-4-4.4.3)
- Define ability to take enforcement action against a driller with a lapsed license who fails to submit delinquent well logs (R655-4-4.9).
- Complete rewrite of Section 5 – Well Driller Disciplinary Procedures. Update of the infraction list and enforcement process with the inclusion of administrative fines (R655-4-5)
 - Define infractions based level of severity
 - Level I Administrative (e.g., late well log)
 - Level II Administrative (e.g., drilling without authorization)
 - Level III Construction (e.g., surface seal)
 - Clarify well driller hearing procedures
 - Define administrative penalties based on level and recurrence
 - Probation
 - Administrative fines
 - Suspension
 - Revocation
- Clarify that wells must be drilled at the approved location (R655-4-8.2)

- Update of steel casing standards (R655-4-9.2.3)
Delete ANSI/ASTM A606
Add ASTM A106 and ASTM A312
- Clarification of interval seal requirements (R655-4-9.4)
Eliminate cross-connection and cross-contamination of aquifers
- Update of the disinfection requirements (R655-4-9.6.5)
Off-the-shelf liquid chlorine compounds containing additives shall not be used
Update table describing amount of chlorine compound needed.
- Clarify the permitting requirements for heat pump wells (R655-4-10.1.4)
Closed-loop systems permitted under non-production well permit
Open-loop systems permitted under a non-consumptive use water right



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Utah Ground Water Association Scholarship Program

The UGWA Scholarship Program is made available to assist and encourage the education of qualified active UGWA members, their spouse, sons, daughters and/or grandchildren.

You are eligible to apply for a UGWA scholarship if you are:

1. An active UGWA member, their spouse, son, daughter or grandchild;
2. A student who is currently enrolled or planning to enroll at a full-time course of study at an accredited two or four year college, university or vocational-technical school and who is accepted by that institution during the year which the scholarship is given.

HOW TO APPLY

You must submit all information in the format you feel will best show your achievements and accomplishments during your scholastic career. Scholarship selection will be based on the following information submitted for review:

- Academic Record (Grade Transcript Required)
- Demonstrated Leadership and Extracurricular Accomplishments
- Written Recommendations From Teachers, Advisors or Counselors
- Economic Need
- Educational and Career Goals
- Work Experience and History

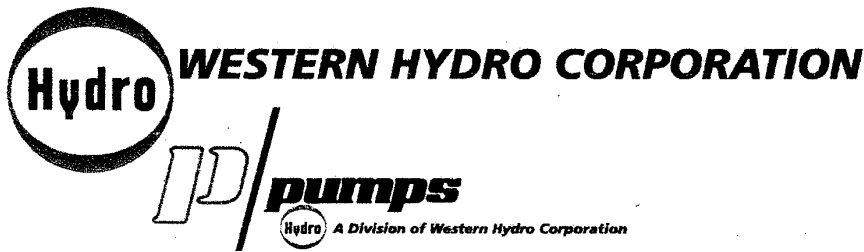
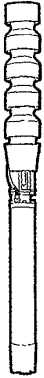
You must submit all relevant information to:

Utah Ground Water Association
c/o Colette Read, Executive Secretary
5577 Walden Glen Drive
Murray UT 84123

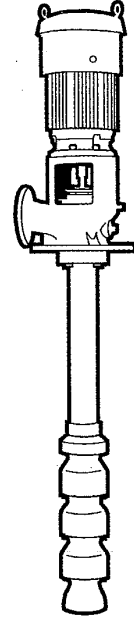
All submittals must be received no later than June 1, 2009. Scholarship awards will be based on the selection process made by the Salt Lake Community College, Office of Financial Aid. All submittals will be confidential. No UGWA members will be involved in the selection procedure and the decision of the Salt Lake Community College, Office of Financial Aid will be final.

SCHOLARSHIP AWARD:

The scholarship award will be in the amount of \$2,000. All awards will be made by check payable jointly to the student and the sponsoring member and must be endorsed by both.



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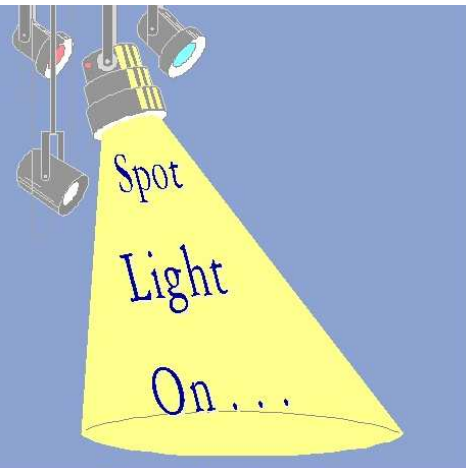
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Richard Petersen

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Richard Petersen is a third generation Well Driller, who is also a NGWA certified Well Driller and pump installer. He started by helping his grandfather Clifford Petersen with rod running on his self built mud rotary rig. He then went to helping his father Herald Petersen running air rods to help develop the wells. Finally his father trained him to run his 72 Speed Star cable rig. At 16 years of age Herald bought a T64 Schram air rotary rig which Richard quickly mastered and ran the drilling of test holes in front of his father for 2 summers. During this time he also was trained on a 36L Bucyrus Erie drill rig and a 71 Speed Star drill rig. Richard also helped his uncles on several different mud and air rotary rigs.

When Richard returned from a 2 year mission from New York City, in which he spoke Greek for his church, he started drilling on his own mostly doing replacement of 6" wells for those people that his grandfather had drilled 1 ½" to 2" wells some 40 years earlier. This only lasted for a couple of years. After taking a five year break he then came back to drill with his father as Petersen Pumps and Wells until his father moved to Montana at which time Richard started Aqua Design Inc.. He then branched out into more than just drilling wells and replacing pumps, he started designing complete systems including water lines for large projects. His father soon returned and came back to work with him in drilling.

After seeing a class on Dual Rotary he decided to grow the way he wanted and still maintain the product he wanted. He needed a Dual Rotary rig to accomplish this and after a year of finance problems he purchased a DR24 which is the center of his work today. Since he started Aqua Design Inc. he has completed several million dollar projects.

Richard's family consists of wife Linda Petersen, children oldest to youngest; Michael Miller, Brandon Petersen, Sariah Petersen, Kristina Petersen, Mathew Petersen and Duke Petersen.

Richard's grandfather started drilling sometime in the late 1920's and he hopes to be drilling or helping one of his sons or daughters make it a 100 year family tradition.

COMMINGLED AND CROSS CONTAMINATED AQUIFERS

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Well drillers and consultants like happy clients. Happy clients pay their bills sooner and with less fuss. A sure-fire method for making clients happy is finding them all the water they need for a price they can afford. Under pressure to succeed in a very competitive climate, we sometimes perforate casing or install well screen and/or gravel pack where we should not and connect aquifers that should be left unconnected. By ensuring short-term gain we sometimes create long-term pain.

At our January 2009 meeting in Mesquite, Nevada, Jim Goddard of the Utah Division of Water Rights (DWRi), also known as the Office of the State Engineer, reminded us that, according to Utah Administrative Code (UAC) R655-4 (the Water Well Rule), “*failure to install interval seals to eliminate aquifer commingling or cross contamination*” is a serious 100-point, Level III infraction. In addition, several water well drillers expressed concern that the commingling or cross contamination of aquifers via wells is causing long-term degradation of groundwater resources in Utah. But what exactly is commingling and cross contamination? How does it happen? Why is it bad? How can it be prevented?

Aquifers become commingled when a well connects two or more previously separate aquifers. More often than not, the hydraulic head, as indicated by the static water level (SWL), is different in different aquifers. Groundwater flows in response to the hydraulic gradient from higher to lower head. Groundwater can flow either upward or downward in a well, depending on the direction of the hydraulic gradient. Jim Goddard showed us video logs where groundwater could be seen flowing from one part of the well to another.

The State Engineer prohibits the commingling or cross contamination of aquifers because:

- Contaminated groundwater can flow into and contaminate a previously uncontaminated aquifer;
- Poor quality groundwater from one aquifer can flow into and degrade the quality of another aquifer;
- Mixing groundwaters of different chemistries can allow minerals to

Dissolve from the aquifer matrix causing overall degradation of water quality and/or

Precipitate and plug perforations, screen, gravel pack, and/or aquifer pores causing reduced well yields;

- Groundwater can be drained from an aquifer causing water levels to fall and wells yields and spring flows to decrease;
- Groundwater can flow into an aquifer causing water levels to rise, groundwater flow directions to change, and structures to become more vulnerable to water damage;
- Well interference effects can extend into aquifers and affect water users that may not have been anticipated in the water right approval; and
- Adverse impacts can go undetected for years and be difficult if not impossible to correct.

Continued on Page 19



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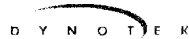


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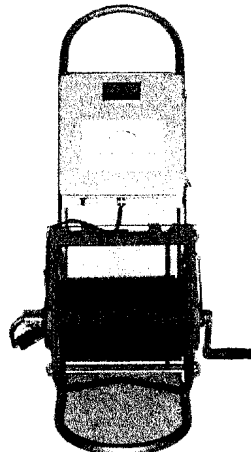
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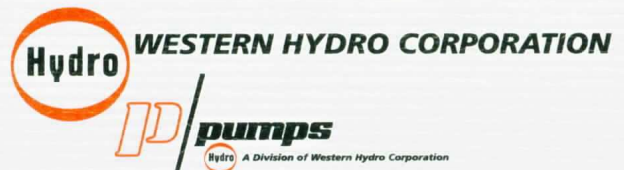


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You can avoid allowing aquifers to be commingled or cross contaminated by:

- Examining each Start Card for a “*Special Conditions*” stamp, asking the owner to show you a copy of the Memorandum of Decision for his water right, and complying with those special conditions;
- Complying with the general procedures, requirements, and minimum construction standards outlined in the Water Well Rule; and
- Paying close attention during drilling for specific warning signs that you may have encountered aquifers of significantly different hydraulic head or water quality and then placing well screens, perforations, gravel pack, and seals appropriately.

The State Engineer has identified specific areas and aquifers in Utah where commingling or cross contamination is a known problem. In these areas the Start Card for a well contains a bold red stamp that reads “*Special Conditions*”. If you see this stamp, you must obtain a copy of the water right Memorandum of Decision from the owner or from the State Engineer to find out what special conditions must be met. According to Jim Goddard, problem areas include the Cedar Valley/Cedar City area and the Cache Valley and problem aquifers include the Navajo Sandstone where it is overlain by geologic formations containing poor quality groundwater.

According to R655-4-4.3.8 of the recently revised Water Well Rule (October 2008), “*Prior to starting construction of a new well, the licensed driller shall investigate and become familiar with the drilling conditions, geology of potential aquifers and overlying materials, anticipated water quality problems, and know contaminated water bearing zones that may be encountered in the area of the proposed drilling activity.*” This can be done by reviewing Well Driller’s Reports (well logs) for wells drilled in the area, checking with the appropriate regional office of the State Engineer or with the well drilling program (Jim Goddard) or checking with the Utah Geological Survey (UGS), the U.S. Geological Survey (USGS), the Utah Department of Environmental Quality (DEQ), local county health departments, and/or a consulting hydrogeologist who is familiar with the area.

Continued on Page 20



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COMMINGLED AND CROSS CONTAMINATED AQUIFERS (CONTINUED)

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Many of the requirements found in sections R655-4-8 through 13 of the Water Well Rule are intended to prevent the commingling or cross contamination of aquifers. An example is R655-4-9.4.1 Surface Seals and Interval Seals – General, which states that “...*Well casings shall be sealed to prevent the possible downward movement of contaminated surface waters in the annular space around the well casing. The seal shall also prevent the upward movement of artesian waters within the annular space around the well casing. Depending upon hydrogeologic conditions around the well, interval seals may need to be installed to prevent the movement of groundwater either upward or downward around the well from zones that have been cased out of the well due to poor water quality or other reasons.*”

Significant changes in fluid level (water or drilling mud), water quality, and/or lithology noted during drilling can indicate that special actions may be necessary to prevent the commingling or cross contamination of aquifers. An example of a significant change in lithology is drilling through a relatively thick clay or confining layer into an underlying sand and/or gravel deposit, or other potential aquifer layer. Suggestions for noticing significant changes in fluid level or water quality include measuring the:

- Depth to the fluid level in the well (1) in the morning, before you start to circulate and/or drill, (2) in the evening, after you shut down, and, if feasible (3) after significant changes in lithology.
- Temperature, and if feasible, the conductivity and/or pH of your drilling fluid or produced water (1) on a regular basis during drilling and, if feasible (2) after significant changes in lithology.

In most cases, temperature is the easiest water quality parameter to measure. It can be measured in both produced water and circulated drilling fluid using an inexpensive and durable thermometer. Measurement of conductivity and pH requires specialized equipment; but are relatively easy to measure in produced water and more difficult to measure in drilling fluid.

Unfortunately, some commingling and cross contamination of aquifers is unavoidable. As with most issues, however, an ounce of prevention is worth a pound a cure and prevention is most effective at the water right approval stage. The State Engineer currently includes special construction requirements in known problem areas and aquifers; however, other areas and aquifers may also need special attention. To help bring attention to this issue, the Utah Ground Water Association (UGWA) can:

Share its concerns with the State Engineer; Help to form a task force or committee to examine and form recommendations to address the issue.

The group would (1) identify other potential problem areas and aquifers in Utah and (2) develop effective area- and aquifer-specific construction requirements to better prevent the commingling and cross contamination of aquifers. Potential members of this group include representatives of the State Engineer, the UGWA, the UGS, the USGS, the Utah Division of Drinking Water (DDW), and other interested groups and individuals.

Groundwater is the sole source of safe drinking water for most people in Utah. Groundwater is also our livelihood and we have a responsibility to help protect and preserve this scarce and precious resource.

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