

## Carey Bridges joins the Division as Wellhead Protection Section Chief

Following the retirement of Beth Marsala, the Division of Geology and Land Survey hired Carey Bridges to serve as the Wellhead Protection Section Chief. Carey started her new position November 1, 2011.

Prior to joining the Division, Carey worked for 12 years in the department's Hazardous Waste Program (HWP) overseeing investigation and cleanup activities at hazardous waste sites throughout the state. The sites ranged in size, complexity, type of contaminants and geologic setting. Carey was responsible for overseeing the siting and installation of monitoring wells. She also reviewed boring logs and well construction diagrams, provided field oversight during on-site activities, and evaluated results of groundwater sampling to identify potential risk to human health and the environment from contaminants. Carey directed additional monitoring well installation for characterization and remediation of contaminants, and she approved abandonment of monitoring wells upon completion of site activities. She holds a restricted monitoring well permit to conduct these duties. Carey brings five years of experience in HWP's Superfund Section where she oversaw investigation and cleanup activities at sites listed on the Registry of Confirmed, Abandoned or Uncontrolled Hazardous Waste Sites, along with sites undergoing action as part of the Comprehensive Environmental Response, Compensation and Liability Act

(CERCLA) process, better known as Superfund. Oversight also included sites listed on the National Priorities List (NPL) such as the Jasper County and Newton County NPL sites. In 2004, Carey moved to HWP's Brownfields/Voluntary Cleanup Section where she served as a project manager working with voluntary parties to investigate, clean up and redevelop brownfield sites. After 19 months, she was promoted to the then, newly-created position of Chief of the Brownfields/Voluntary Cleanup Unit where, in addition to supervising the unit, she continued to oversee investigation and cleanup activities at sites enrolled in the voluntary program. The unit typically managed more than 300 active sites. During Carey's tenure, the group reached the milestone of cleaning up more than 600 sites. She served five and one-half years as Unit Chief prior to joining the Wellhead Protection Section.

Carey received a Bachelor of Science in Geology from the University of Central Missouri in Warrensburg and a Master of Science in Geology from the University of Missouri - Columbia. Following graduate studies, Carey taught an introductory geology course as an adjunct professor at Westminster College in Fulton while also working for the department. Carey is licensed in Missouri as a Registered Geologist. Feel free to contact Carey at 573-368-2171.

## Well Installation Board News

The Missouri Well Installation Board held its quarterly meeting November 7, 2011, at the Missouri Department of Natural Resources complex in Rolla. The Board reviewed and made decisions about two permit appeals and received updates about enforcement cases, rulemaking actions and section activities. The Board also held a meeting December 7, 2011, via conference call, and voted to approve the final Order of Rulemaking for the apprentice rule, 10 CSR 23-1.050.

The next quarterly meeting of the Well Installation Board is scheduled for 10 a.m., Friday, March 30, 2012 at the Clinton Community Building, 501 Campanella Drive in Sikeston, Mo. Please check our webpage for details about the meeting: [dnr.mo.gov/geology/geosrv/wellhd/wib/](http://dnr.mo.gov/geology/geosrv/wellhd/wib/).

A subsequent meeting is scheduled for 10 a.m., Friday, May 11, 2012 at the Missouri Department of Natural Resources' Annex Conference Room, 111 Fairgrounds Road in Rolla.

## New Down-Hole Camera System

The WHP Section's Investigation and Remediation Unit recently acquired new down-hole camera equipment that will enable the section to better serve the drilling industry and the general public. The system is a substantial upgrade to the cameras used previously. The new camera has down-view and side-view capabilities that can both be utilized while the camera is inside a well. The camera will toggle between views at any depth and has the ability to record and produce a DVD of the well video while onsite. This camera will enable staff to identify broken areas or other well construction issues with a greater degree of accuracy. It will improve staff ability to make recommendations about packer placement for wells that require a liner, etc. The new equipment also affords staff the ability to better identify problems with casing and grout seals. Staff members are researching equipment that will upgrade the older cameras to make them more useful.



## Reminder – Permit Renewal with Outstanding Violations

At permit renewal time, any outstanding violation must be resolved before a permit will be renewed pursuant to 10 CSR 23-1.105 which states, “A permit will not be renewed if the permittee has any unresolved violations pending against his or her permit, unless a schedule to remedy the violations has been approved by the Division.” Please contact staff at 573-368-2165 with any questions you may have. Look for more information in the Spring issue of *The Connection*.

## Open-hole vs. Positive Displacement Grouting

The water well certification form (780-1902) requires contractors to identify the method of grout installation utilized when installing a well. During certification review, staff observed that several contractors selected “open-hole” as the method of grout installation, but the well appears to be short several bags of grout. Follow up with well contractors revealed positive displacement was the actual method used for grout installation, and the amount of grout listed was correct. In an effort to reduce telephone calls and letters to contractors, clarification of terms, as defined by the Division, is provided below.

The “open-hole” grout installation method should be chosen when the appropriate amount of grout is placed into the open well bore and the casing is forced through the grout to the casing point; this results in grout inside the casing as well as in the annular space. Then, the entire length of grout must be drilled through to complete the well to the total depth.

The “positive displacement” grout installation method should be marked on the form when the casing is set into the borehole, grout is poured into the casing, and a drillable plug is used to force the grout through casing and into the annular space. Little to no grout should remain inside the casing. The drill is then re-inserted into the hole and only the drillable plug must be drilled through to complete the well to the total depth.

Questions regarding grouting methods or completing the forms can be addressed to staff by calling 573-368-2165.

## Plugging Public Water Supply Wells

The rules contained in 10 CSR 23-3.110, Plugging of Wells, do not outline the procedure necessary for plugging public water supply wells or bedrock irrigation wells. Each plugging is considered on a case-by-case basis, and specific requirements are issued through the Department’s Water Resources Center. Contractors are required to contact Water Resources staff before plugging any public water supply or bedrock irrigation well. If the well is being plugged full length with neat cement, staff with the Water Resources Center should be notified prior to plugging. The Water Resources Center can be contacted at 573-368-2175, mowaters@dnr.mo.gov, or PO Box 250, Rolla, MO 65402.

## Well Online Form Submittal-WOLFS

WHP staff have been working the past two years to establish an online submittal process for monitoring wells. The project has changed considerably over time, and we now have a system that will not only accept forms and payment of fees electronically, online, but also checks submissions for regulatory compliance and issues a certification or registration number. WHP staff members believe this new system will be significantly more efficient for staff and monitoring well contractors.

The Well Online Form Submittal (WOLFS) application can be used to submit certification and abandonment forms for monitoring wells; however, there are a few exceptions. Any work that requires a variance (whether construction or abandonment) cannot be entered online, nor can nested monitoring wells. In the future, the section’s goal is to expand WOLFS to include water wells, heat pumps, and test holes. However, no timeline has been established for expanding the current system.

Well records must be submitted by either the primary contractor or the driller. Users will be required to log in to WOLFS using their permit number and an access code that is randomly generated by the application. Users will also need a valid email address and Adobe Acrobat Reader (a free program, available on the Internet). The well records are entered in a step by step fashion and validated by the application. Due to the nature of this endeavor, the validations are written to exactly mirror the rules. Ambiguities that can be interpreted by staff on paper forms may not be acceptable in WOLFS. Multiple records may be entered during each session for certification or registration, the same job site, or a different one. WOLFS accepts payments via credit card or electronic check. Records must be printed after payment, but before logging out of the system. It is important to note that records will not be accessible to drillers or contractors after the session ends. Records will be maintained by WHP staff.

WHP staff members worked with several partners to bring this project to fruition. Thanks go to the team with the state’s Information Technology Services Division (ITSD) for making the system technically possible. Specifically, the department extends thanks to Ken Arthur, the project’s ITSD technical lead. The department also thanks the Petroleum Storage Tank Insurance Fund and the Fund’s Director Carol Eighmey for support, insight and assistance.

Form 780-1902

## House Bill 250

The last edition of *The Connection* contained an article regarding House Bill 250, legislation signed by Gov. Nixon in August 2011. House Bill 250 specifies any well that exclusively serves a charitable or benevolent organization will be exempt from all rules relating to well construction except rules that apply to constructing a multi-family well, unless the well or pump installation for the well is determined to present a threat to groundwater or public health. A water system cannot be exempt if it regularly serves an average of 100 or more people for at least 60 days of the year or if it serves a school or daycare facility.

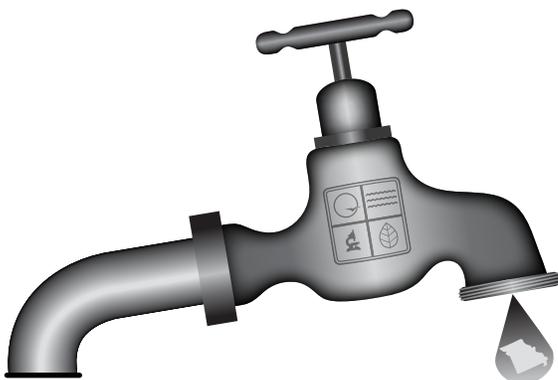
WHP staff have been working with the Department's Public Drinking Water Branch (PDWB) to determine the process by which these types of wells will be managed. Inquiries regarding drilling these types of wells will be referred to the appropriate regional office to discuss public water system requirements. Fact sheets will also be available to explain the legislation and obligations of the contractor and well owner. All construction details relating to the well, such as casing points and variances, will be managed by WHP.

Because these wells are constructed to multi-family standards, which are regulated under the Water Well Driller's Act, new water well certification forms are being developed to aid in the reporting and certification of these types of wells. The form will include check boxes for the well owner to complete. The well owner will address the following topics:

- Well use.
- Size of the organization.
- If the well will serve a school or daycare.
- Whether the well will be served via a piped service connection to any house or building that is not a part of the organization.
- If the well serves a charitable and/or benevolent organization.

The form will also include a disclaimer from PDWB regarding the status of the well and/or any exemptions. The certification form must be submitted to the division for review and certification. Wellhead staff will then forward a copy of the form and any relevant documentation to the appropriate regional office for their records.

Information regarding these types of wells will be added to the division's webpage and will be mailed to all water well and pump installation contractors. Please direct questions to division staff by calling 573-368-2165 or locate and call staff in a Regional Office: [dnr.mo.gov/regions/regions.htm](http://dnr.mo.gov/regions/regions.htm).



## Wellhead Protection Section

We are here to ensure any new private well drilled in Missouri is constructed to minimum standards as set by state regulations. This helps protect our groundwater resources from contamination due to poor well construction. We regulate the construction of private water wells (this includes domestic and multiple family class wells), irrigation wells, monitoring wells and heat pump wells. In addition, we regulate how to properly plug all types of wells. Our job is to balance the concerns of the land owner and the driller, while at the same time performing our overall directive of protecting Missouri's vast underground water supply from contamination due to improper construction and abandonment of wells.



## Wellhead Protection Section Staff

Wellhead Protection Section: 573-368-2165

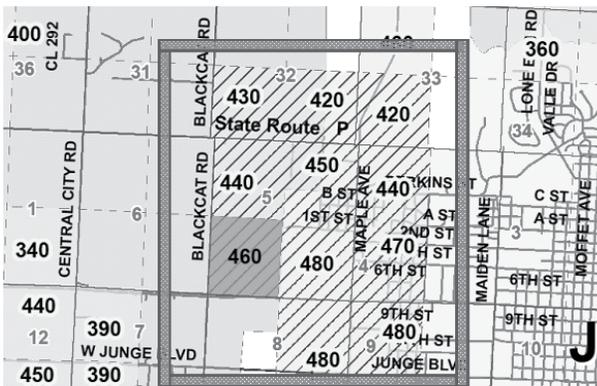
Website: [dnr.mo.gov/geology/geosrv/wellhd/job.htm](http://dnr.mo.gov/geology/geosrv/wellhd/job.htm)

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# Special Area 2 Updates

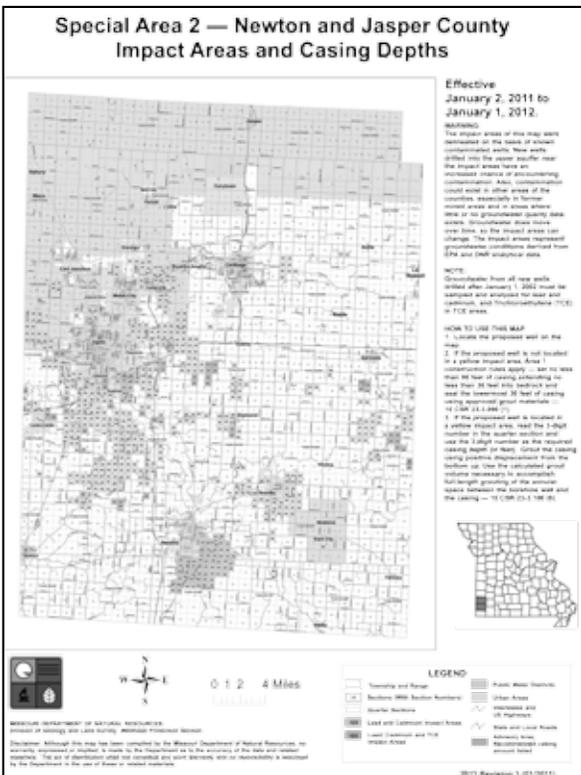
Each year, the WHP Section reviews and updates the casing depth map for Special Area 2. New impact areas are added to the map when contamination is confirmed through groundwater sampling data received from well or pump contractors and the U.S. Environmental Protection Agency (USEPA). When a new well is drilled or an old well deepened, the well or pump contractor must collect a water sample for analysis to identify the potential presence or absence of contamination that may affect an area. Data is also collected by the USEPA and environmental contractors for areas within Newton and Jasper counties. If information about contamination is provided from a source not directly from a new or recently deepened well, an area may be placed in advisory status. This data is collected for new and existing wells. When available, any published updates, including changes to area roads, are also added to the newly revised map.

New maps are reviewed and updated during the months of November and early December, the year prior to publication. Newly issued maps are valid January 1 of the new year through January 1 of following year. Each map published has the effective dates clearly noted. It is important to be sure the correct map is being used when drilling in Newton and Jasper counties, as an older version may not have all the known impact areas highlighted. The map for the period of January 1, 2012, through January 1, 2013, contains new impact areas and advisory areas. These areas are listed below.



Township North	Range West	Section	Quarter Section	Type Area	Minimum Casing	Contaminant to Sample for
27	33	4	SW	IMPACT	470	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
27	33	4	NW	IMPACT	440	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
27	33	5	NW	IMPACT	440	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
27	33	5	NE	IMPACT	450	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
27	33	5	SE	IMPACT	480	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
<b>27</b>	<b>33</b>	<b>5</b>	<b>SW</b>	<b>ADVISORY</b>	<b>460</b>	<b>LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS</b>
27	33	8	NE	IMPACT	480	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
27	33	9	NW	IMPACT	480	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
28	33	32	SW	IMPACT	430	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
28	33	32	SE	IMPACT	420	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS
28	33	33	SW	IMPACT	420	LEAD, CADMIUM, TCE, TCE DEGRADATION PRODUCTS

An electronic copy of the Special Area 2 Map is on the Well-head Protection Section's Publication webpage at [dnr.mo.gov/geology/geosrv/wellhd/wellpub.htm](http://dnr.mo.gov/geology/geosrv/wellhd/wellpub.htm), or you may call 573-368-2165 to obtain a hard copy of the map.





## National Groundwater Awareness Week is March 11-17, 2012

*Groundwater awareness is important to you!*

Groundwater is essential to the health and well-being of humanity and the environment. You can help raise awareness about the importance of protecting our groundwater during National Groundwater Awareness Week. The National Ground Water Association began this recognition week 12 years ago, and it has since grown into a recognized national event. Learn more about National Groundwater Awareness Week by visiting this website:

[ngwa.org/Events-Education/awareness/Pages/default.aspx](http://ngwa.org/Events-Education/awareness/Pages/default.aspx)

## Welcome

The following individuals are now part of the Missouri Department of Natural Resources' permitted contractor community:

Amazing Comfort – Brian Snodderly  
ATC Assoc – Elizabeth Schlaeger  
Buffalo Creek Water Systems – Ryan Huston  
Clark Water Well Service – Matthew Heroux  
Comfort Care Heating & Cooling – Michael Gonnella  
Davis Structure & Development – William Davis  
Dawson-Dodd Heating & Cool – Patrick Dodd  
Elam Heating & Air Cond. – Nicholas Logsdon  
Groundwater & Environmental – Brian Idstein,  
Adam Wolozyn  
Keeven Heating & Cooling – Anthony Guerrant,  
Randall Hayes  
Loop Tech International – Ralph Cadwallader  
MFA Oil – David Grothoff  
Terracon – Eric Schatz

## Welcome

The following individuals are now part of the Missouri Department of Natural Resources' permitted apprentice contractor community:

Burge Irrigation – Andrew Chasteen, George Foster

## Rule Updates

There are currently three Missouri Well Construction rule amendments moving through the rulemaking process. Draft rules are available on the division's webpage at [dnr.mo.gov/geology/geosrv/geo-rules-in-dev.htm](http://dnr.mo.gov/geology/geosrv/geo-rules-in-dev.htm).

The "apprentice" rule, 10 CSR 23-1.050, is being amended to address issues staff encountered when the apprentice program first became a rule. A public hearing was held November 28, 2011 to receive comments about the proposed amendment. The public comment period ended November 30, 2011. No comments were received. The Well Installation Board approved the final Order of Rulemaking December 7, 2011. The Order of Rulemaking will be published in the Missouri Register March 15, 2012. The rule will become effective April 30, 2012.

The Board voted, at its November meeting, to table discussion of the heat pump construction rules (10 CSR 23-5.010 – 10 CSR 23-5.080) until the next meeting.

A change to the rule, Disciplinary Action and Appeal Procedures (10 CSR 23-1.075) is also being proposed. This proposed language clarifies the procedure to file an appeal with the Well Installation Board. Staff will bring the proposal to the Board at its next meeting for approval.

If you have any questions regarding these rulemakings or the rulemaking process, please contact Sheri Fry.

## Farewell

The following individuals are no longer permitted to operate as contractors according to the Water Well Drillers Act and Well Construction Regulations:

Bio Geo Solutions – John Larson  
Black, Craig  
Brookfield Plumbing & Supply – Herbert Huck  
Bureau Veritas North America – Scott Wisher  
F E Young Drilling – David Young  
Golder Associates – Michael Lemon  
Jerry Williams Pump & Well Service – Michael Sprong  
K2 Construction – Duane Crawford  
Kindle Heating & Cooling – Steven Kindlesparger  
Logan Well Drlg & Pump Service – Earl Logan  
Lynn's Well & Pump – Howard Beanland  
MO DNR – Jennifer Kehrle, Maria Kargus  
Riverfront Environmental – Joshua White  
Smith, Richard  
Spence Irrigation – Donald Spence, Strobel, Jonathan  
Terracon – Nicholas Laskares  
Tichenor Drilling – Carry Joe Tichenor  
Whittington, Robert  
Wideman Well Drilling – Kenneth Wood

## Water Resources Center hires new Groundwater Section Chief

With the retirement of Jim Vandike, after more than 30 years of service to the Department of Natural Resources, the Water Resources Center has hired Scott Kaden to serve as the Groundwater Section Chief, effective November 1, 2011. Scott was formerly with the department's Division of Geology and Land Survey and most recently served as Economic Geology Unit Chief with the division's Geological Survey Program.

The department's Groundwater Section has five main areas of responsibility:

- 1) To maintain 163 groundwater level observation wells.
- 2) To conduct source water assessment of public water supply wells.
- 3) To process casing depth requests and review cuttings for large capacity wells including public water supply wells.
- 4) To maintain a database of the state's major water users.
- 5) Assist the public, industry and other governmental agencies with inquires related to groundwater issues.

You may contact Scott Kaden or other Groundwater Section staff by email at [mowaters@dnr.mo.gov](mailto:mowaters@dnr.mo.gov), by phone at 573-368-2175 or by fax at 573-368-2193. Visit the Groundwater Section's webpage at [dnr.mo.gov/env/wrc/grdh2o.htm](http://dnr.mo.gov/env/wrc/grdh2o.htm).



*The Connection* is published biannually by the Missouri Department of Natural Resources' Division of Geology and Land Survey. Suggestions, ideas and comments concerning this newsletter are welcome. Send comments to: Missouri Department of Natural Resources' Division of Geology and Land Survey, Wellhead Protection Section, PO Box 250, Rolla, MO 65402-0250, Phone: 573-368-2165 or Fax: 573-368-2317

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