



# TANKS

## CONSULTANT CONNECTION

MARCH 2008

VOLUME 2, ISSUE 1

### Inside this Issue

**Revising the Petroleum  
Missouri Risk-Based  
Corrective Action Guidance**

**Are You Prepared for Safety  
at Your Cleanup Project?**

**Is There a Better Way?**

**Working Together to  
Identify Old Tank Sites**

**Tank Closure Seminar**

**Department Makes New  
Tanks Database Available  
on the Web**

**Help Us Conserve Resources**

**Department Holds Tanks  
Conference**

**Chibnall Leaves  
Tanks Section**

**Your New Tanks Section  
Closure and Technology  
Unit Chief**

**Accurate and Complete  
Closure Reports Help  
Reduce Review Time**



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### **The Role of Site Conceptual Models in the MRBCA Process**

The Missouri Risk-Based Corrective Action Process for Petroleum Storage Tanks guidance explains a site conceptual model should be developed for each site when contaminant concentrations exceed the default target levels. While the development and use of a site conceptual model applies to all sites having or suspected of having environmental contamination, this article specifically pertains to petroleum storage tank sites.

A site conceptual model is a tool to organize information and guide data collection and risk assessment activities at a site where contaminants have or are believed to have been released into the environment. The primary purposes of the model are to describe a site and its environmental setting, the nature and extent of contamination and the likely pathways of exposure the contamination could pose to current and future human or ecological receptors. From a practical perspective, a model can take one or more forms. The graphic form seems to be the most common and readily useful. Regardless, the form should lend itself to easy modification, revision and refinement, as one of the key aspects of a model is its dynamic nature.

An initial site conceptual model is developed after project decision goals are defined and historical information and the results of initial investigations are gathered. This initial model will include and, in fact, might strongly rely on assumptions and theories. The initial model directs the scope and focus of site characterization and risk assessment activities. Subsequent revisions to the model validate or refute the assumptions and theories of each earlier model.

As information is gathered at each stage of the site characterization process, the new data is used to review initial hypotheses and revise the model accordingly. Ultimately, the assumptions and theories present in the initial model are replaced by facts collected through specific data, the type and extent is determined by the model. This replacement of assumption and theory with fact is critical to the overall model and is commonly referred to as model validation.

The site conceptual model can be thought of as a three-dimensional vision of a site. In practical terms, the model is best presented graphically, with known or suspected contaminant sources, transport pathways/mechanisms, media, routes of exposure and potentially exposed populations depicted. These elements are essential to the site conceptual model. Without them, the model is incomplete. An incomplete model results in an incomplete or inaccurate risk assessment, which can result in unacceptable risk to humans or the environment. This is essentially a failing of the MRBCA process. As with any model, if input to the model is flawed or its scope too narrow, what is revealed by the model will also be flawed and too narrow.

The initial site conceptual model should include all sources, media, transport mechanisms and pathways that are of reasonable or at least plausible concern, now and in the future. Sources, pathways, transport pathways or receptors the evaluator believes to be minor should not be initially excluded. Rather, these should be identified in the model and the text of the risk assessment should explain why they were not

quantitatively investigated or evaluated. Revisions of the model should also show how these minor elements were evaluated, even if only qualitatively, and the conclusions reached.

As model validation activities proceed, hypotheses regarding sources, transport mechanisms, exposure pathways, routes of exposure and other site conceptual model elements are tested and revised based on factual validation data. As data becomes available, each element of the model is validated and revised accordingly.

This process results in a fully validated model and a sound base for an accurate and appropriately scoped risk assessment emerges.

While the site conceptual model is essential to identifying and focusing needed site characterization and risk assessment activities, validation of the model through adequate and appropriate site characterization is critical to defining the scope, and ensuring the accuracy, of the overall risk assessment. Without such validation, the model is of little value. The model is a means to an end rather than an endpoint. The structure and organization brought about by the model should result in an accurate assessment of whether and how contaminants will cause excessive risk, that is, a true and accurate risk assessment. The truth and accuracy of the risk assessment are entirely dependent on the site characterization data being of a quality to accurately validate the model. If the risk assessment includes assumptions or theories, the model was not adequately validated and the risk assessment is incomplete. The model can and should be frequently evaluated for such assumptions and theories. If any are found, the model can be revised and the corresponding data gaps filled. Identifying and addressing such inadequacies during model validation rather than after the risk assessment is thought to be complete makes for a much more efficient process.

In summary, the site conceptual model is an essential part of any Risk-Based Corrective Action process, forming the base on which the risk assessment is built. The model serves as a guide to structure, scope and direct site characterization and risk assessment activities to test hypotheses and replace theories and assumptions with facts. The site conceptual model development and validation process, when moved through thoughtfully, deliberately and with care, can result in an accurate and complete risk assessment the first time no revisions needed.

## **Revising the Petroleum Missouri Risk-Based Corrective Action Guidance**

The Department of Natural Resources wants your input in revising the Petroleum Missouri Risk-Based Corrective Action guidance document. As a stakeholder this is your opportunity to provide input into this document. The department will notify stakeholders by E-mail when the draft revised sections are posted on the department's Web site at [www.dnr.mo.gov/env/hwp/draftdocintro.htm](http://www.dnr.mo.gov/env/hwp/draftdocintro.htm). If you would like to be included on the E-mail notification list, please contact Krista Welschmeyer at (573) 526-0971 or by E-mail at [krista.welschmeyer@dnr.mo.gov](mailto:krista.welschmeyer@dnr.mo.gov).

Stakeholders may submit comments by E-mail to [tim.chibnall@dnr.mo.gov](mailto:tim.chibnall@dnr.mo.gov), [ken.koon@dnr.mo.gov](mailto:ken.koon@dnr.mo.gov) and [krista.welschmeyer@dnr.mo.gov](mailto:krista.welschmeyer@dnr.mo.gov); by fax to (573) 526-8922; or by mail to Missouri

Department of Natural Resources, Hazardous Waste Program, Underground Storage Tank Section, P.O. Box 176, Jefferson City, MO 65102-0176.

The draft revisions posted to the Web are provided in a Microsoft® Word® document. The department has used the "track changes" feature in Word® to identify proposed changes. If stakeholders choose to make comments to the document electronically, they are encouraged to continue using the track changes feature and select an additional color to clearly identify their suggested revisions. This will help the department find your comments quickly.

## **Are You Prepared for Safety at Your Cleanup Project?**

Contractors and consultants doing tank removals, installations, repairs, investigation and remediation work at tank sites should have a site-specific health and safety plan for the project. A health and safety plan is required to comply with Occupational Safety and Health Standards included in HAZWOPER 29 CFR 1910.120.

Site-specific health and safety plans identify and analyze each task or operation at a work-site for potential hazards. For each hazard, worker protection precautions are specified. Site health and safety plans are of key importance to worker protection as well as environmental protection.

These plans are not required to be submitted to the department. Workers or observers entering the job site may ask to see and sign your health and safety plan. These plans should be provided to all parties entering the work site. Every person whom enters the job site should read and sign the health and safety plan so they know the hazards of the site and the safety procedures to be followed in the event of an accident. Additionally, these plans should be updated and provided to workers that might be exposed to contamination during future construction activities.

## **Is There a Better Way?**

Over the last several years, the Department of Natural Resources' Tanks Section has evaluated its process for reviewing documents and asked the question, "Is there a better way?" This evaluation has resulted in changes to improve our document review and tank site overview processes.

One major change included assigning a specific project manager to each site rather than using the "team approach." The project manager will know the detailed history of the site, be up to speed on the project and, consequently, will be able to process new documents more quickly. This change should improve the section's overall efficiency.

Another change made improves the section's consistency. Project managers are required to regularly participate in internal meetings to discuss specific policies, procedures, and technical issues. These meetings have resulted in a more consistent application of the guidance provisions by our project managers.

In 2007, the Tanks Section published its first newsletter directed to the consultant community and held its first Tanks Conference. Both were efforts to provide important, consistent information to consultants regarding the Risk-Based Corrective Action process

and the inner workings of the Tanks Section. More importantly, the newsletter and conference sought to gain information from consultants regarding how the section can further improve. The section is planning to offer additional opportunities for training and dialogue in 2008.

In addition, the Tanks Section is in the process of revising the RBCA guidance and plan to roll out a revised document this spring. The revisions focus on parts of the guidance document that have been unclear, ill-defined or confusing during the past couple of years of implementation. In addition, the section will add provisions to the guidance pertaining to soil type dependent risk-based target levels by request of our stakeholders. Revising the guidance is critical to ensuring the process used to evaluate and close tank sites is thoroughly protective of human health and the environment and is clear, reasonable and efficient. The revised guidance will more clearly define the path to No Further Remedial Action status.

Many of the documents the section receives are preliminary risk assessment reports. The reports are preliminary because the sites have not been adequately characterized. Without adequate characterization, a complete risk assessment cannot be developed. The department cannot close a site without a complete risk assessment (unless, of course, concentrations of all chemicals of concern are below default target levels). A preliminary assessment can be useful, but, as discussed below, preliminary risk assessments are of limited value to the department.

A preliminary risk assessment can be a useful part of a site conceptual model but is not itself an endpoint. A site conceptual model should be developed for every tank site evaluated under the RBCA process to ensure characterization and risk assessment efforts are focused appropriately. The model does not end with the development of a preliminary risk assessment.

A preliminary risk assessment is of little value to the department because it only shows part of the picture. However, the Tank Section recognizes a consultant might find a preliminary risk assessment very useful in helping to identify data gaps, focus data collection efforts and revise and update the site conceptual model. With that said, the section would prefer preliminary risk assessments are not submitted to the department unless the preliminary assessment reveals a condition constituting an acute or immediate risk to human health or the environment. Any such condition should be considered an environmental emergency and reported at the earliest practical moment to the department's emergency spill line at (573) 634-2436.

Preliminary risk assessments will be given a cursory review to determine any immediate risks are present. If no immediate risks are found, the section will request a site characterization be completed.

The Tanks Section is focusing on specific priority sites in the coming year. Prioritization is based on several factors, such as drinking water impact and redevelopment potential. The department will give priority to these sites in the review process. The department will hire an environmental contractor to work on some of the lower priority sites.

Is there a better way? Yes. The Tank Section will continue to make improvements. However, the section can not complete this task alone. The section also encourages consultants to share their ideas on ways to improve the guidance document. Hopefully, these efforts will help improve the quality and completeness of submittals and improve efficiencies and turnaround time for everyone involved in the process.

## **Working Together to Identify Old Tank Sites**

The Department of Natural Resources' Tanks Section and the Petroleum Storage Tank Insurance Fund together identified database errors. The project began with a look at the department's database to find records of properties that were registered and regulated but where taken out of service. Review of the resulting list revealed that some "No Further Action" letters issued by the department in the early 1990s were not recorded in the database. So, the department reviewed more than 2,800 files of former facilities to find old No Further Action letters, and then updated its computer records accordingly. The database has been updated accordingly.

Of the 2,000 files reviewed that were flagged as having missing tank closure data, the department has no data on whether or not the tank closure is complete and, therefore, cannot issue a no further action letter. However, because the Petroleum Storage Tank Insurance Fund has a "sunset date" of Dec. 31, 2010, its Board of Trustees decided to undertake an effort to identify and contact the current owners of these properties to alert them to the opportunity to file a claim.

To find out more about the project or the eligibility of any current or former tank facility, contact the Petroleum Storage Tank Insurance Fund at [www.pstif.org](http://www.pstif.org) or by calling 1-800-765-2765.

## **Tank Closure Seminar**

The Missouri Department of Natural Resources' Tank Section and the Petroleum Storage Tank Insurance Fund co-sponsored an Internet Seminar on May 24, 2007. The department's Closure and Technology Unit presented the topic *Tank Closures, a General Guide to a Closure Report*, followed by a presentation from the Petroleum Storage Tank Insurance Fund's Dan Henry, which included suggestions for expediting the process for getting costs pre-approved and the claim closed.

The department's presentation was aimed at providing guidance to consultants on what information is needed by the department to issue a No Further Action Letter. The department developed a closure checklist in conjunction with this seminar, which is available on the department's Web site at [www.dnr.mo.gov/pubs/pub2218.pdf](http://www.dnr.mo.gov/pubs/pub2218.pdf). The checklist will help consultants in preparing closure reports that contain all of the required information.

Every tank closure can be different. This checklist will not address every situation that may occur at a tank closure. Providing good clear narrative in the closure report and documentation with pictures will help the Tanks Section understand what was done at the site. This can eliminate delays in the review process or requests for clarification.

Documents and audio from the seminar are available at [www.dnr.mo.gov/env/hwp/tanks/ustclosureseminar.htm](http://www.dnr.mo.gov/env/hwp/tanks/ustclosureseminar.htm).

## **Department Makes New Tanks Database Available on the Web**

A new, searchable tanks database is available to download from the department's Web site at [www.dnr.mo.gov/env/hwp/downloads/hwpet.htm](http://www.dnr.mo.gov/env/hwp/downloads/hwpet.htm). The database is updated weekly and includes petroleum tank facility locations, tanks, owners, inspections and releases in a new, convenient, menu-driven application. This new database provides convenient access to tank facility records. We anticipate users will find a number of uses for the new system including:

- Searching for registered underground storage tank sites.
- Finding the file numbers for a facility record.
- Reviewing information about active tank facilities.
- Verifying tank information.
- Reviewing data on facility inspections.
- Locating information on the status and progress of tank remediation projects, including recently received correspondence.

This last item is an area where we hope this new database can be especially helpful. We receive many calls from contractors wanting to know if the department has received or is working on a given piece of correspondence. With this data, the consultant or contractor can search the ST#, click on the mail log and search for recent remediation and closure correspondence for that site.

We look forward to your questions as you review the data. This will help us continue to improve the accuracy for each site.

The electronic data is still no substitute for the official record as regulation requires an original signature. The official record is kept in our files at the Jefferson City offices. You may contact Rhonda Loveall at our records center at (573) 751-3043 to obtain a copy of the file (files can be copied for a fee) or schedule a review.

## **Department Holds Tanks Conference**

The Hazardous Waste Program's Tanks Section hosted a conference on Oct. 16 and 17, 2007, at the Truman Hotel and Conference Center in Jefferson City. This was the first tanks conference held in Missouri in several years.

The conference targeted environmental consultants who provide services to tank owners and operators. There were 142 participants who attended the conference. The conference provided consultants with training on the Missouri Risk-Based Corrective Action process for petroleum storage tanks. We hope all found the training valuable. We recognize that providing training opportunities like this can, in the long run, help minimize or eliminate project delays.

Department employees, private consultants and laboratories and others presented training about tank closure, risk-based and groundwater issues as well as karst geology. Additionally, 10 vendors set up booths at the conference. The U.S. Environmental Protection Agency also participated in the conference as an exhibitor and in a supporting role.

The department will present a one-day tanks workshop as a part of the Missouri Waste Control Coalition's Environmental Conference being held June 22 - 24.

The workshop will include training regarding the Missouri Risk-Based Corrective Action process for petroleum storage tanks. More information about the conference is available on the Web at [www.mowastecoalition.org](http://www.mowastecoalition.org).

## **Chibnall Leaves Tanks Section**

Effective Jan. 1, 2008, Tim Chibnall, Technical Environmental Specialist IV, left the Tanks Section for a position in the Hazardous Waste Program director's office. While with tanks, Chibnall served as the primary resource for technical issues and led efforts to implement and revise the Missouri Risk-Based Corrective Action process. In his new position, he will continue to work on revising the petroleum MRBCA guidance through its completion in mid-2008. He will also be working on aligning the provisions of the petroleum and departmental Risk-Based Corrective Action processes as much as possible and will serve as the primary technical resource for the program director's office.

Technical issues regarding specific tank sites that were previously directed to Chibnall should now be directed to Laura Luther, Remediation Unit Chief or Ken Koon, Tanks Section Chief. You may continue to contact Chibnall regarding issues related to the petroleum guidance and proposed revisions. The Tanks Section hopes to have the vacant position filled soon.

## **Your New Tanks Section Closure and Technology Unit Chief**

Chris Veit is the new Hazardous Waste Program, Tanks Section Closure and Technology Unit Chief. Before coming to the Tanks Section, Veit inspected underground storage tank facilities for the Hazardous Waste Program's Compliance and Enforcement Section. Veit conducted

compliance, closure, temporary closure and new installation inspections. He also supported Tanks enforcement personnel with case development and as a technical advisor. In addition to enforcement case management, Veit helped develop a new tablet computer inspection system for use by hazardous waste generator inspectors in the field. Veit became the Tanks Section Closure and Technology Unit Chief on Nov. 16, 2007.

Prior to working for the department, Veit spent 11 years working at Lincoln University and six years in the U.S. Navy as a boiler operator. He received his Bachelor of Science degree in Agriculture/Natural Resources from Lincoln University. Veit joined the department in 2001.



## **Help Us Conserve Resources**

One of the primary goals of the federal and state hazardous waste laws and regulations is to promote the conservation of our valuable material and energy resources. Since the enactment of the Resource Conservation and Recovery Act in 1976, the department has searched for ways to reduce its consumption of energy and other natural resources.

One major change the department made several years ago was to begin duplexing all of our letters and reports. The benefits have been enormous. Not only has this greatly reduced our consumption of paper and printing costs, it has saved energy and filing space and reduced generation of paper waste. Now every printer and copier the department purchases has the capacity to duplex.

The department is also exploring ways to replace paper documents with electronic ones. Some programs in the department now provide for online, electronic submittals of permit applications and monitoring reports. While the Tanks Section is not yet ready to begin receiving electronic copies of your letters and reports, we would like to ask that, if possible, you begin duplexing your correspondence and reports. Please join our efforts to conserve resource in this small but significant way.

### **Accurate and Complete Closure Reports Help Reduce Review Time**

The department's first formal closure guidance document was created in 1992. It outlined the necessary items to document proper tank closure. This was later expanded upon in the 1996 Closure Guidance Document. The basics of tank closure to this day have not significantly changed even in the most recent MRBCA guidance. However, project managers have noticed they are sending requests to consultants for information that is necessary to include in all closure reports. We thought this would

be a good opportunity to include a list of items we typically request consultants to complete and return to the department. Providing this information in advance and in a complete form can help staff provide a quick and thorough review of your documents. A list of those items that should be included in all closure reports is summarized as follows:

- A three-day notification to the Tanks Section prior to the initiation of closure activities.
- When evidence of a release is identified this finding must be communicated to the department via a phone call to the spill line.
- Clearly state which cleanup levels you are using to evaluate the degree of contamination at the site.
- The observed condition of the tanks.
- The amount of soil removed from the tank pit.
- The depiction of underground utilities at, and adjacent to, the subject site.
- Photographs depicting the cleaned interior of the tanks.
- Delivery of samples to the laboratory within 24 hours of collection.
- Maintaining samples at 4 degrees Celsius from the moment they are sampled until the time that they are delivered to the laboratory.
- Materials coming in contact with the interior of the tank are considered hazardous waste until proven otherwise via analytical testing.
- If water is present in the tank pit you must determine if it is groundwater.



#### **Tanks Section Employees:**

Front row left to right: Laura Luther, Marlene Kirchner, Betty Finders, Lizzie Hansen, Valerie Garrett, Mike Washburn, Theresa Doggett, Katie Light, Hashim Mukhtar, Ron Sheeley, Liz Scheppers Back row left to right: Jeff Heisler, Dave Walschauser, Ken Koon, Matt Alhalabi, Vince Henry, Brett Bottomley, Jeff Kutenkuler, Vickie Olive, Sandy Repper, Chris Veit and Krista Welschmeyer Not pictured: Rick Brown and Heather Maschler.

## We Want You to Keep Getting Our Newsletter!

Getting information to tank owners/operators is important to the Tanks Section. The mission of the Department of Natural Resources is to protect, preserve and enhance Missouri's natural, cultural and energy resources. Future newsletters will be sent out electronically to both reduce the amount of paper used and save tax dollars spent on postage. If you wish to receive this newsletter in the future, please provide Krista Welschmeyer with your E-mail address. Krista can be reached by E-mail at [krista.welschmeyer@dnr.mo.gov](mailto:krista.welschmeyer@dnr.mo.gov) or by phone at (573) 526-0971 or toll-free at 1-800-361-4827. We also realize that not everyone has access to E-mail. If you still wish to receive a paper copy, please let Krista know. Newsletters are posted on the department's Web site as they are published at [www.dnr.mo.gov/env/hwp/news.htm](http://www.dnr.mo.gov/env/hwp/news.htm).



Tanks Consultant Connection is a free semi-annual newsletter that informs readers about tanks issues. If you would like to be added to our mailing list, please fill out the information below and return it to Missouri Department of Natural Resources, Krista Welschmeyer, P.O. Box 176, Jefferson City, MO 65102-0176. This newsletter is also available on the Web at [www.dnr.mo.gov/env/hwp/news.htm](http://www.dnr.mo.gov/env/hwp/news.htm).

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