Remediation and Redevelopment External Advisory Group

ISSUE PAPER

CONCEPTUAL SITE MODELS AND SITE INVESTIGATIONS

NR 700 EAG Subgroup

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This proposal and recommendations were developed by the Remediation and Redevelopment External Advisory Group and members of the public, and do not necessarily represent the opinions or the position of the Wisconsin Department of Natural Resources or other state agencies.

TYPE OF RECOMMENDATION

This issue paper includes recommendations for revising DNR administrative rules, creating or revising DNR guidance materials, and instituting changes to internal DNR processes.

BACKGROUND

The goal of this issue paper is to explore specific issues that arise under ch. NR 716 and identify solutions for improving clarity and regulatory efficiency.

This issue paper identifies seven topics for future action:

1. Conceptual Site Model
2. Site Investigation Scoping and Work Plan Preparation
3. DNR Technical Review Requests
4. Groundwater
5. Lab Data Interpretation
6. Visual Aids
7. Iterative Site Investigation (SI) & Comprehensive Site Investigation Report (SIR)

This issue paper summarizes results and recommendations; **Attachment A** provides full background and detailed proposals on each topic.

PROPOSAL

This issue paper identifies topics for administrative rule development, guidance template development, or for DNR internal process adjustments. **Attachment A** provides full background and detailed proposals on each topic.

RESOURCES NEEDED

Items identified within this issue paper for administrative rulemaking are, as a single rulemaking effort, estimated to take approximately 2,000 staff hours. The rulemaking also involves the support of an appointed rule advisory committee during rule development, public communications and involvement during the rule development, economic impact, and public hearing processes.

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Guidance development involves staff time and public input. The amount of staff time for these activities varies widely based on the type of guidance (template, form, guidance) and whether it is new or revised.

Changes to internal DNR processes involve staff time and vary depending on the nature/impact of the change. In some cases, changes to internal DNR processes may involve the need for additional staff.

COMMENTS

Changes proposed in this paper are intended to improve regulatory efficiency, which would benefit regulated parties through time/cost savings and improves the DNR's ability to carry out its statutory duties under Wis. Stat. § 292.11. Improvements are anticipated to benefit Wisconsin residents, through better protection of human health and the environment by:

- Reducing responses to insufficient documentation (reports);
- Identifying potential exposures to receptors earlier in the cleanup process;
- Creating documents or diagrams that may be used to communicate environmental issues at a site;
- Allowing more efficient responses to potential exposures to contamination; and
- Reducing the time spent on investigation (getting to cleanup faster).

Parts of this proposal contemplate that administrative rule revisions would result in increased fees for DNR technical assistance under Wis. Admin. Code chs. NR 700-799. During issue paper drafting, the participants raised the following concerns:

- The impact of requiring DNR approvals for additional reports, along with DNR review fees, may disproportionately affect smaller entities (under B. Site Investigation (SI) Scoping).
- Concerns with the identified approach of instituting a graduated scale for expediting reviews, such that regulated parties may pay a higher DNR technical assistance fee for faster review (under C. DNR technical review requests).

Increased or graduated-scale DNR service fees could have a disparate impact on small businesses and organizations that cannot compete with larger, better-resourced businesses and organizations. Overall communities would benefit broadly from better protection of human health and the environment.

ATTACHMENTS

Attachment A: Background

Attachment B: DNR Comments

ATTACHMENT A: BACKGROUND

CONCEPTUAL SITE MODEL (CSM)

Issue background (CSM):

Interstate Technology and Regulatory Council (ITRC) defines a CSM as "a three-dimensional visualization of site conditions that allows for evaluation of contaminant sources and affected media, migration pathways and potential receptors".

Administrative code does not explicitly name a CSM as a requirement, although many components of a CSM are necessary to complete a site investigation in accordance with ch. NR 716. A CSM is an ongoing/living model or diagram that starts during site investigation scoping and builds with each iteration of the investigation and when remedial actions are taken. However, administrative code does not define CSMs and does not clarify when CSM development should begin or how to present a CSM as part of the site investigation (SI) process, the remedial action options report (RAOR), the remedial action plan (RAP), or case closure request.

Wis. Admin. Code § NR 716.15(3)(a) requires the SI report to include the scoping information identified in § NR 716.07.

Typically, RPs do not submit a Site Investigation Work Plan (SIWP) to the DNR, nor is a presentation of the § NR 716.07 scoping information included in the SI report; therefore, it is difficult for the DNR to understand what is being investigated, how the history of the site is related to the reported contamination, potential receptors, etc.

The CSM is critical to developing a complete SI report. A CSM in a flexible format is needed with updates throughout the investigation, remedy, and closure. Further, examples for simple vs. complex sites and well-defined parameters are needed. The results and data interpretation sections of the SI report should rely heavily on and reference the CSM.

With exception to scenarios when immediate or interim action is appropriate, the RP should demonstrate that the SI is complete before conducting remediation/response action and before case closure is requested. It is common that the SI is not complete prior to initiating remedial action. Many SI reports are submitted with or just prior to case closure and without enough information to demonstrate that the SI is complete. Also, frequently the case closure request is the first submittal received with a request for DNR technical assistance review (with fee) and response. Most cases are not closed following the initial case closure request, because additional SI work is needed.

Proposal (CSM):

Administrative code changes and guidance development are recommended.

- Code changes could require the development of a CSM as defined by ITRC. This definition, which specifically calls for a three-dimensional visualization, may require clarification so that regulated parties have the flexibility to present a CSM that is

appropriate for the complexity of the site. Proposed code language would clarify that a plan view and a section view is required; however, a complex 3-D visual computer model is not required.

- Code changes could require a CSM to be developed and maintained as a communication and decision- making tool throughout the Wis. Admin. Code chs. NR 700-799 process. Code changes could outline the following potential CSM steps:
    - Begin developing a CSM when a hazardous substance discharge is reported.
    - Evolve the CSM as scoping information is gathered.
    - Include the initial CSM in the submittal of an SIWP and include updated CSMs with subsequent submittals throughout process, including closure.
    - As site investigation data are collected, update the CSM.
    - Include the CSM in the SIR and show the nature, degree, and extent of contamination in all affected media, migration pathways, and receptors of contamination.
    - The CSM directly supports the RAOR/RAP in evaluating remedial options.
    - Include the CSM in the closure application to demonstrate that the site investigation is complete, how the response/remedial actions addressed the contamination, and that engineering controls address residual contamination in a manner that is protective of human health and the environment.
- Guidance could supplement code revisions to assist regulated parties. CSM examples as part of a guidance document could be created for simple and complex sites. Templates may be needed.

SITE INVESTIGATION (SI) SCOPING AND WORK PLAN PREPARATION

Issue background (SI Scoping):

The Site Investigation Work Plan (SIWP) requires scoping information (NR 716.09). Responsible parties do not submit SIWPs to the DNR for most cases, although they are required for the initial investigation and desired for iterations of investigation when the initial investigation indicates more work is needed. Regulated parties risk a delay in the cleanup process due to an incomplete SI if they do not submit a SIWP. If no SIWP is submitted, it is difficult for the DNR to understand how and why an investigation was scoped and other DNR document reviews and responses can take longer as DNR staff work to understand site conditions and work plan decisions. Submittal of work plans should be required for each iteration of site investigation. The SI can expand in detail and complexity over time. It is difficult and time-consuming to determine compliance based on multiple SIWP reviews that don't include previous scoping information or provide the evolving understanding of the site conditions.

The Site Investigation Report (SIR) requires scoping information (NR 716.15, NR 716.07). SIWP and SIRs are difficult for the DNR to review without adequate background information and presentation of general site conditions.

The pace of the investigation should be considered when developing a SIWP. For investigations where the responsible party needs to move forward quickly, but multiple field iterations are anticipated, consider stepped or dynamic work plan approaches that outline

how an RP will move forward with additional investigation based on the initial fieldwork (e.g., stepping out monitoring wells based on specific pre-defined criteria).

Phase I ESA /AAI or desktop ESA-like documents could provide background information. Other states like Minnesota and Indiana require a Phase I ESA as part of entry into some programs.

Proposal (SI Scoping):

Administrative code revisions are recommended:

- Require submission of SIWPs and scoping information, including CSM info. Leave flexibility in code to add certain scoping information only when relevant to the site.
- Require SIWPs to be submitted for DNR technical assistance/review (with fees) when additional SI field work is proposed.
- Require subsequent SIWPs to be submitted with a DNR technical assistance fee (per plan) when additional investigation steps are proposed.
- Enable the DNR to outline the content of SIWPs (e.g., SIWP checklist) which may include quality assurance information or sampling and analysis strategies.
- Enable DNR to require iterative SIWPs to contain all previous background data and evolving understanding of site conditions based on field investigation results and/or clarify whether additional SIWPs require all previous background data that was submitted as part of previous SIWP.

Further research and potential inclusion as administrative rule changes is recommended for the following:

- For required scoping information, consider requiring information the history of site, the receptors, and its status as a wetland, archeological site or other special consideration plus site specific climatologic information).
- Research requirements regarding “sensitive receptors” in other states and consider these approaches for inclusion in administrative rule changes.
- Consider inclusion of a requirement to submit Sampling and Analysis Plans (SAPs).
- Consider inclusion of a requirement to submit Standard Operating Procedures (SOPs) for fieldwork.
- Consider including the ability for DNR to request Quality Assurance Project Plans (QAPPs) at specific sites in addition to the quality assurance and control information currently required under NR 716.13.
- Consider establishing a combined DNR technical assistance fee for SI/RAORs and RAOR/RAPs.

DNR TECHNICAL REVIEW REQUESTS

Issue background (DNR technical review requests):

The DNR receives very few technical assistance requests (with fees) for SIWPs, SIRs, or RAORs. The lack of DNR technical oversight for these submittals may compound issues and delays and reduce efficiency in cleanup.

Requiring technical assistance (with fee) for all SIWP submittals is likely to result in feedback to the RP that ensures compliance with administrative code early on and keeps the project on track. However, under the current requirements the RP may be disincentivized to submit an SIWP with a fee for DNR review. The regulatory scheme outlines that for non-fee based SIWP review, field work may not begin for up to 30 days after submittal of SIWP. For fee based SIWP review the field investigation shall be initiated within 60 days after DNR approval of the work plan.

Requiring a graduated fee for expediting technical assistance reviews (i.e., paying a higher fee provides faster turnaround time from the DNR) may partially address the efficiency issue. However, a graduated fee may not be the best method to prioritized technical assistance and may result in prioritizing RPs that can afford a higher fee, which is unequitable to small business and parties with limited resources. For example, an individual property owner may not have means to pay a fee, much less a larger fee, to expedite technical assistance for their case, whereas a large real estate developer may be able to do so.

Consideration for expedited technical assistance based on human health risk may be more appropriate. For example, a faster turnaround for a site with TCE contamination and human receptors, for example, is likely to result in better health outcomes.

Proposal (DNR technical review requests):

Administrative rule revisions are recommended for consideration:

- Provide a consistent timeframe (begin field work 60 days following submittal) for submittals that request DNR technical assistance (with fee) and those that do not request DNR technical assistance (with fee)
- Incentivize submittal of a technical assistance request (with fee) by reversing the current waiting period to begin field work (e.g., set review time to 90/180 days without a DNR technical assistance request and 30/60 days with a DNR technical assistance request).
- Reconsider review timeframes based on feasibility and impacts, i.e., staff capacity and construction project timeframes as many projects are not able to wait 90/180 days for DNR response.
- Require DNR technical assistance with fees for SIWPs, SIRs, RAORs, and RAPs.
- Allow a graduated scale for expediting DNR turnaround time (i.e., paying higher fee provides faster DNR review, or higher risk sites receive priority DNR turnaround time). Consider the inclusion of certain high-risk prioritization criteria or an exemption should allow such sites to receive priority without an increased fee.
- Establishing (or maintaining) the payment of fees on a payment-per-report basis.
- Consider available strategies for addressing documents that are submitted to the DNR without a fee (for example, declining to review these documents, or requiring all document fees be paid prior to closure.)

GROUNDWATER

Issue background (Groundwater):

Natural Attenuation: Wis. Admin. Code § NR 716.13(13) requires natural attenuation parameters to be collected during the SI with analysis and interpretation of geochemical indicators and parameters. Often when natural attenuation is a potential remedy or partial remedy, the consultant's justification of natural attenuation as a remedy is limited to decreasing contaminant concentrations and does not include interpretation of geotechnical indicators and parameters. This issue occurs frequently enough to merit addressing. If natural attenuation will likely be a component of the remedial action (which is true in many cases), the SIWP should include collection of natural attenuation parameters. The SI report should summarize the natural attenuation parameters and the sub-surface conditions that are present to support contaminant degradation. Field parameters at a minimum should be included, along with hydraulic conductivity information.

Temp wells: It is unclear that the correct use of temporary wells (i.e., wells that do not comply with NR 141 construction requirements) and grab samples are for field screening purposes. These results are generally not considered to be representative of groundwater conditions and are not sufficient for regulatory compliance (i.e., the results may not be used to demonstrate that concentrations of contaminants in groundwater are below an enforcement standard). Administrative code requires DNR approval for a temp well variance (for wells not complying with ch. NR 141) prior to use in a site investigation.

Also note that industry terms and DNR definition of temporary wells differ.

There is opportunity to define temp wells and clarify time frames in ch. NR 141. Also, this issue affects the SIWP, which should include methods or standard operating procedures prior to significant implementation of work.

Whether permanent or temporary, the focus for wells in this context should be on collection of groundwater samples that are free of sediment and representative of the water unit.

Proposal (Groundwater):

Administrative rule revisions are recommended for consideration:

- Clarify when field monitoring of dissolved oxygen, oxidation-reduction potential, pH, temperature, and alkalinity is required under state administrative code and clarify that it must be submitted as part of SI report.
- Require that certain MNA parameters be included in the SIWP based on contaminants identified during discharge notice. Require field parameters along with hydraulic conductivity information.
- Add clarity regarding temporary groundwater monitoring wells and grab samples; clarify terminology to be consistent with industry terms.
- Further clarify types of temporary wells used by industry and when pre-approval is required for use of monitoring points that are not compliant with ch. NR 141.

Guidance may also be considered in addition or as an alternative for the following items:

- Temporary well guidance could be reestablished (possibly following respective changes in ch. NR 141).
- Further clarify types of temporary wells used by industry and when pre-approval is required for use of monitoring points that are not appropriate for comparison with groundwater quality standards (non- compliant with ch. NR 141).

DNR internal procedure recommendations may be considered:

- MNA shortcomings could be addressed during DNR response to SIWP (in addition to other approaches). Based on contaminant identified during discharge notice, certain MNA parameters could be identified.

LAB DATA INTERPRETATION

Issue background (lab data interpretation):

Data interpretation: Most site investigation reports (SIRs) do not include the interpretation of data required under § NR 716.15(3)(h). Often, the results are presented, but there is no discussion of how the nature, degree and extent has been defined in all environmental media and impacts to receptors, or how field conditions, laboratory results, data gaps and other limiting conditions affect the data interpretation.

J-flagged lab data: If lab results are estimated or "J-flagged," those lab results require interpretation; however, there is typically no discussion of how the RP/consultant considered the J-flagged data to be representative of site conditions. At times when they are discussed, the consultant dismisses the results due to the J-flag (i.e., misinterprets that they are non-detect due to the flag or that the flag renders the results as low concentrations, without consideration to either the laboratory's detection and reporting limits or the regulatory standards).

Method Detection Limits: Increased method detection limits (e.g., due to dilution or interference) that result in "no detect" (or J-flags) of a contaminant of concern when the method detection limit is at or above the residual contaminant level (RCL) or enforcement standard.

Exceptions noted by the lab during analysis of environmental samples: The SIR should discuss any samples noted by the lab as not being received in an appropriate condition (e.g., sediment in water, air in VOC vial, outside temperature limits). Many times when the lab identifies that the environmental samples have been received in a condition that may affect the results, it is not discussed in the SIR. For example, if the samples were not received on ice or there is air in a sample vial, the data results may be affected. Many other states require a QAQC discussion and evaluation in reports.

Proposal (lab data interpretation):

Data interpretation: Further discussion of the issue, causes, and potential resolutions for lack of interpretation of data required under NR 716.15 (3)(h) is needed. Some approaches that have been identified for consideration are:

- Consider whether administrative review for completeness applies (DNR internal process change)
- Define status report in ch. NR 700 and expectations (rule change)
- Use the SI outline and dictate results interpretation
- If no interpretation is made, the DNR may state that the site will be considered "out of compliance" and a template response letter is generated stating a standard time frame to come back into compliance (with a fee assessed).

J-flagged lab data: Further discussions of issues ("J-flagged" interpretation and discussion of how data is representative of site conditions), causes, and potential resolutions is needed.

- What would data interpretation include? Compare laboratory detection and reporting limits to regulatory standards (residual contaminant levels, enforcement standards).

Some approaches identified are:

- Consider administrative rule changes requiring a data interpretation section in SI Report.
- Consider administrative rule changes defining a "j-flag" to be treated the same as non-j- flag until evidence is given in the contrary (e.g., not detected anywhere else, no source, and not in groundwater and soil, both lab detection and reporting limits are below cleanup standards).
- This would all be part of a sampling and analysis plan and quality assurance project plan. Define a Quality Assurance and Quality Control (QA/QC) process.

Method Detection Limits:

- Direct the RR program to work with DNR's lab certification program to define how the lab manages this information in its QA/QC program.
- Incorporate this information into a QA/QC document submitted with initial site report.
- Include elevated detection limits in report
- Clarify whether this will this be interpreted as above the RCL standard (see NR 720.07(2))
- Consider requiring data validation section in SI Report

Exceptions noted by the lab during analysis of environmental samples: Administrative rule revisions are recommended:

- Require QA/QC report discussion and data validation section in SIR

VISUAL AIDS

Issue background (Visual Aids):

Variability in Flow Direction. Variations in flow direction must be illustrated on water table and potentiometric surface maps under NR 716.15(4)(b)1, however, typically, only one flow direction map is provided with no discussion of variability in flow direction, which can affect receptors and remedial options. Lack of data is often related to lack of MNA information.

Isoconcentration Maps. Maps should include data to support illustration/depiction of the extent of contamination displayed as isoconcentration lines. See NR 716.15(4)(c). Maps should include both isoconcentration lines and data.

Cross Sections. Include data to support illustration/depiction of extent of contamination displayed as isoconcentration lines. See NR 716.15(4)(d). Cross sections should pass through the source area(s) and along potential/known migration pathways to potential receptors.

Photographs. Photographs are required, but rarely submitted, to document site work (§ NR 716.15(4)(f)). Occasionally, DNR staff have learned through site visits that site work was reported inaccurately. Photos may assist in documenting completed work.

Proposal (Visual Aids):

Further discussion of issues, causes, and potential resolution(s) is needed. Some approaches identified are:

Administrative rule changes:

- Clarify exactly what DNR wants for visual aids and update "visual aids" and other terms to be consistent with current federal and state usage.
- Clarify when photographs are appropriate and what types of photos DNR is requesting.
- Require a figure and table numbering scheme similar to that for closure submittals. As the SI expands, updates to these figures would be required.
- Grant monies for implementing and maintaining a database for laboratory data, similar to the GEMS monitoring well network, for which the date of event and lab data are uploaded based on Facility ID and associated with a single monitoring well to allow swift downloading and platting.
- DNR may be able to provide a consistent list of visual aids and items to include, but site variability and complexity need to be considered if additional/other information is needed.
- Put the data on the map.
- For contaminated media affected by seasonality, data is required in each season.

DNR internal process changes:

- Consider whether administrative review for completeness applies.
- In combination with an administrative rule requirement (listed above) for a figure and table numbering format, consider whether grant monies or other financial resources may be available for implementing and maintaining a GEM-style data portal where data is uploaded based on Facility ID.

ITERATIVE NATURE OF SI & COMPREHENSIVE SIR

Issue background (Iterative Nature of SI & Comprehensive SIR):

Often, multiple SI reports are submitted to the DNR. The DNR recognizes that the SI is an iterative process; however, if multiple SIRs and technical reports with SI data have been submitted, a comprehensive report is needed to integrate and interpret all the data that has been collected to respond to the hazardous substance discharge. Frequently, DNR staff must review multiple reports to determine if the degree and extent of contamination has been defined in all environmental media. A requirement to provide summary figure(s) and table(s) that include all the site data from multiple rounds of sampling for any SI submittal would be more efficient and allow for a much less time-consuming review process.

Proposal (Iterative Nature of SI & Comprehensive SIR):

Further discussion of issues, causes, and potential resolutions is needed. Some approaches identified include the following administrative rule revisions:

- Revise administrative code to clarify the requirement for submission of a comprehensive SI that consists of all relevant data and visual aids, considering the time gap between sampling events, as applicable.
- Consider code revisions that would allow for hourly assessed DNR technical assistance fees at a "cost not to exceed" for any submittal. Base on established submittal templates.

Consider clarification in guidance of the following:

- Issues surrounding contamination crossing property lines, including entry permissions and liability issues.

ATTACHMENT B: DNR Comments

The RR Program appreciates the efforts of the NR 700 Subgroup and the recognition that a site investigation that adequately characterizes the nature, degree and extent of contamination is an essential step prior to selecting a remedy and eventually seeking case closure at a contaminated site in Wisconsin.

CSMs

A conceptual site model would aid the DNR in reviewing site investigations and remedial actions completed by RPs by presenting a whole picture of site characteristics, geological and hydrogeological conditions, transport pathways, and receptors that may be affected by contamination. Conceptual site models may also property owners, communities and the public understand how contamination was discharged, where it migrated, and how effective cleanup efforts were. They may also serve as communication tools that reduce uncertainties for prospective purchasers and developers who desire to reuse contaminated properties. Conceptual site models vary in complexity based on site-specific characteristics and the type of discharge to the environment.

Site Investigations

- Although it is required in administrative code (Wis. Admin. Code § NR 716.09(1)), many RPs do not submit site investigation work plans to the DNR prior to proceeding with a field investigation. In addition, it is not clear if subsequent site investigation activities (field investigation) require additional work plan submittals under administrative code.
- Site investigation work plans and site investigation reports that are submitted to the DNR are often lacking required scoping information (Wis. Admin. Code § NR 716.07).
- Site investigation work plans and site investigation reports are often submitted to the DNR without a request (and fee) for DNR review.
- Site investigation workplans completed in accordance with administrative code base the proposed field investigation activities upon a baseline understanding of site conditions, transport pathways and receptors. Moving forward with field investigation activities without that baseline information may result in incomplete site investigations, which delays an RP's path to case closure.
- In addition, when the DNR receives a site investigation report but does not receive the scoping information that is required in both the site investigation workplan and the site investigation report, it is difficult to assess both the rationale behind the field work and the completeness of the investigation. This may result in the DNR not approving the site investigation.
- Phase I environmental site assessments are only required for properties in the voluntary party liability exemption program.

DNR Technical Review Requests

- Rule changes would be required to implement some of the options presented.
- SI work plan review timelines It is likely that a change in incentivization for fee submittals would increase the amount of technical reviews by the DNR. An unintended consequence could be that the RR program has more work than staff capacity and response expectations will not be met.
- Recommendations in this proposal will require careful consideration of the RR Program's ability to implement, such as capacity for increased workload.

Lab Data Interpretation

Rule changes would be required to implement some of the options presented.