Summary of comments received on draft guidance PUB WA 1013, Reducing or Terminating Groundwater Monitoring at Solid Waste Landfills

July 2014

Full text of comments is included following the table.

Name/organization	Brief summary of comments *(DNR response)*	Change
Bruce Hensel/ Natural Resource Technology, Inc.	Table 2. Indicate that if the DNR has agreed to remove sampling parameters from the monitoring program in the past, these parameters do not need to be sampled again to request closure. *This will depend on the reasons why the department agreed to remove the sampling parameters and if any conditions to the situation have changed.* Table 2. Clarify that VOC analysis would not be required at sites where the DNR had previously determined that VOC analysis was not required. *We generally agree for industrial landfills; however, we would require VOCs at municipal solid waste landfills even if VOCs were not previously required. Historically VOCs were not required as part of detection monitoring primarily because of cost. Today the cost of VOC analysis is significantly lower.*	None None
John Luczaj/ UW-Green Bay	Clarify whether guidance only applied to landfills solely regulated under Wisconsin Admin Code.	The first bulleted item under "Generally Speaking" on page 2 was modified and clarification was added to the last bulleted item on page 3.
Erik Lietz/ Ayres and Associates	p3. Sites with burning in the past are not expected to have VOCs, but are more likely to have metals. p. 6, Typographic mistake.	Sentence was changed to indicate VOCs would not be expected. Burning would not change the presence of metals. Typo corrected.

	p. 12, Clarify whether information required is referring to one or both lists in Appendix B. p. 13, Item 7, Site registry should be required as a part of Plan of Operation. *Almost all sites potentially eligible to terminate monitoring were sited without a Plan of Operation that is now required of all new landfills* p.13, Item 8, Requests should be signed by a Professional Geologist and not a Professional Engineer. *The geology and hydrogeology of landfill sites will vary in complexity. A hydrogeologist with the DNR will review all requests, and will use their professional judgment as to whether a site has been sufficiently characterized. Where there has been substantial geologic or hydrogeologic interpretation, we would expect a hydrogeologist's signature, as required by code.* p. 13, Item 9, It is expensive to have small landfills perform hydraulic conductivity testing if it had not been done in the past. *The need for hydraulic conductivity testing, if it does not exist, is up to the judgment of the DNR hydrogeologist, based on other site information.*	Wording changed to refer to one list. None None The word "available" was added to the text.
Helga Guequierre	I don't think it is good policy to lessen monitoring seepage from landfill sites. Careful monitoring has led to better quality water for drinking and recreational purposes. *Reduced monitoring would only be considered at sites where monitoring has shown that drinking and surface waters are not at risk of contamination.*	None
Linda Shepard/ Badger Disposal, Inc.	We have a landfill in Columbia County that was closed about 32 years ago. We would like to be considered if this goes thru to closing this landfill. *This is a site specific comment and was forwarded to the assigned DNR hydrogeologist.*	None
Terry Johnson, et	Frequency Reduction Basis- Additional considerations	None

al./Waste Management of Wisconsin	in reducing groundwater sampling frequency are other monitoring programs such as lysimeters, site specific hydrogeologic monitoring zones and the independence of samples. *These topics are not precluded from consideration for reduced groundwater monitoring frequency. However, the vast majority of sites that this guidance will apply to are non-approved (by the DNR), non-engineered sites that did not have significant hydrogeologic investigations prior to their operation.*	
	Applicability- Federal Subtitle D regulations allow approved states to reduce groundwater monitoring frequencies to "no less than annual."	A sentence was added to the first bullet on p.3 indicating that sampling at a frequency less than semiannual can be approved, but that this guidance document does not address all of the items that could pertain to such a request.
	General Guidelines- The guidance would be more useful if it discussed additional rationales for flexibility including time-of-travel, risk based frequency, staggered sampling schedules and reduced upgradient monitoring. *These are legitimate but relatively technical topics that are beyond the scope of the guidance document. They may be appropriate to be included in a plan modification request, but should be discussed with the DNR hydrogeologist for a site.*	None
	Other Clarifications- As predictors of potential risk from a site, hydrogeology is more important than size for unlined landfills, and both of these are less for engineered landfills. *The importance of size, hydrogeology and engineering design are items that the DNR will take into account when evaluating a request for reduced or terminated monitoring. The point is well made that the importance of each of these depends upon a variety of factors of a specific site.*	None

	Parameter Optimization- The guidance is silent on the topic of the value and usefulness of the quantity of parameters analyzed and whether the multiple samples and sampling locations are providing redundant results. ASTM standard D 7045-04 provides a framework for optimizing sampling while maintaining protectiveness at reduced cost. *The points raised are beyond the scope of this guidance document, but merit further discussion with the Department, and we would be open to such a discussion in general or in the context of a specific facility.*	None, but topic merits further discussion with the Department
	Termination of Groundwater Monitoring- It is unclear why the presence or absence of leachate and landfill gas extraction systems is not an indicator that future contamination is unlikely. The existence of such systems is directly related to the Organic Stability Rules and a functional stability model. *The guidance document is primarily focused on reduced monitoring at the several hundred long-closed landfills in the state, and very few of these have liners and leachate collection and gas extraction. The items raised in this comment will need to be addressed in the future by the Department.*	None, but topic merits further discussion with the Department We did clarify the presence of active leachate and gas extraction system bulleted item on page 4.

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Mr. Joe Lourigan
Wisconsin Department of Natural Resources
Delivered via email

June 20, 2014

RE: Natural Resource Technology Comments on Proposed PUB-WA 1013

Dear Mr. Lourigan,

Natural Resource Technology, Inc. appreciates the opportunity to comment on proposed guidance document PUB-WA 1013 Reducing or Terminating Groundwater Monitoring at Solid Waste Landfills. We support DNR's efforts to streamline groundwater monitoring programs, when such streamlining can be performed in an environmentally protective way, both for logistical and technical reasons. One of our primary technical reasons for supporting this approach is that certain statistical methods that may be used to analyze groundwater monitoring data lose power when unnecessary parameters are included in the analysis.

Below, we provide two comments for your consideration when you finalize this guidance. Underlining indicates proposed additions while strikethrough indicates proposed deletions.

- The DNR request in Appendix B to sample for the additional parameters listed in Table 2 is reasonable if these parameters have never been monitored or have not been monitored a sufficient number of times; however, it is not a reasonable request for sites where these parameters were monitored in the past and DNR has approved removing them from a groundwater monitoring program. We recommend clarification that these additional parameters be monitored for the application only if they have never been monitored in the past, and offer the suggested wording below for DNR consideration:

  "To help support a future reduction in groundwater monitoring to less than semiannual, the DNR will request that you conduct groundwater monitoring for select public health and public welfare parameters (in Table 2 below) to document the concentrations of or lack of these parameters in groundwater at the facility. Some landfills may already be monitoring for some of these parameters or may have had them added to a plan modification that reduces monitoring from quarterly to semi-annual or annual. For parameters with only 2 rounds of sampling suggested, please conduct 4 additional rounds if one of the first two rounds has a result exceeding the chapter NR 140 preventive action limit (PAL) for that parameter. Monitoring for these parameters in not required for landfills where DNR has previously approved their removal from groundwater monitoring programs. Monitoring of public health parameters provides a direct measurement of representative toxic compounds that may be released by a landfill. Appendix D outlines quality assurance considerations for VOC samples."

- We are concerned that the wording in footnote 2 of Table 2 is not clear and may be misinterpreted by third parties who request documentation and DNR approvals related to this guidance. Footnote 2 states that VOC analysis is generally not necessary for industrial landfills, such as coal ash landfills, where it is not expected in the leachate. We believe that DNR can clarify this footnote with the following modifications:

  "VOCs would be required if they are used as a part of industrial processes at an industrial site. They are not required at sites where DNR has previously determined that VOC monitoring is not required as part of a groundwater monitoring program, and would generally not be required at sites where VOCs are not expected in leachate. For example, VOCs would not be expected in coal ash leachate~~, and analysis for VOCs in groundwater would not generally be necessary~~."

Please note that absence of commentary on other aspects of this guidance does not necessarily indicate our concurrence with those items. Do not hesitate to contact me if you have any questions.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Bruce Hensel, PG
Principal Hydrogeologist

Lourigan, Joseph J - DNR

From: Luczaj, John <luczajj@uwgb.edu>
Sent: Thursday, June 05, 2014 10:24 AM
To: Lourigan, Joseph J - DNR
Subject: Landfill

Dear Joe,

I have read the recent guidance titled, "Reducing or Terminating Groundwater Monitoring at Solid Waste Landfills". While I am not a landfill operator or specialist, I do have experience as a hydrogeologist, and I hope that my comments might be helpful to the department. Overall, I think the document was very well written and appears to cover most reasonably expected conditions.

In the comments below, I have noted some typographical errors and a few places where some clarification might help. Please let me know if you have any questions, or if I can provide further assistance.

Sincerely,

John Luczaj
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COMMENTS ON LANDFILL GUIDANCE:

On page 2, a statement reads, "….the department is likely to allow you to reduce the monitoring frequency from quarterly to semi-annual. This is possible at any type of landfill."

This is confusing because on page 3, it states that this guidance (document) does NOT apply to certain types of landfills.

Should the statements on page 2 be amended to read, "…the department is likely to allow you to reduce the monitoring frequency from quarterly to semi-annual. This is possible at any type of landfill *that is regulated solely under Wisconsin Administrative Code*."? Some form of clarification would be helpful.

Lourigan, Joseph J - DNR

From: Lietz, Erik <lietze@AyresAssociates.com>
Sent: Monday, June 16, 2014 5:08 PM
To: Lourigan, Joseph J - DNR
Subject: Comments on DRAFT Ground Water Reduction at Landfills Guidance

Joe,

Those of us at Ayres Associates that work with environmental monitoring at both open and closed landfills have reviewed the DRAFT guidance document WA1013 and have the following comments or questions:

Comments

- Page 3 – Item 3, in a bullet point about "Waste at the landfill were periodically burned" was the intent to say wastes were NOT burned. While burned waste would reduce VOC's and other organics, we believe burned waste results in a greater chance of metals being present in the soils.

- Page 6 – in the 4th bullet point about expedited plan modifications, **DNRt** is a typographic mistake.

- Page 12 – Appendix C – Item 1, does the reference to include all information and maps in Appendix B refer to all information in both lists in Appendix B? It would be less confusing if the required items were listed again in Appendix C – Item 1, even if they are duplicate.

- Page 13 – Appendix C – Item 7, the Site Registry form we believe is something that the DNR should require as part of a plan of operations or other site licensing agreement. This requirement as part of the ground water reduction request seems to be a duplicated effort.

- Page 13 – Appendix C – Item 8, the Professional Geologist or Engineer certification we feel should be restricted to only Professional Geologists as the majority of Professional Engineers do not have the background in geology or hydrogeology to fully prepare the reduction request and technical items required by this guidance.

- Page 13 – Appendix C – Item 9, historical results of hydraulic conductivity testing should be considered as subsurface conditions, such as conductivity, do not change significantly over time. Small sites without previous hydraulic conductivity testing could have an option of using textbook conductivity values based on soil types as this field testing is expensive to conduct.

Questions

- Page 13 – item 4, what if boring logs are unavailable from all sources (DNR, Owner, consultant, WGHS)?

Thanks
Erik

Erik Lietz, PE
Civil Engineer

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Lourigan, Joseph J - DNR

From: DENIS D GUEQUIERRE <hguequierred@sbcglobal.net>
Sent: Tuesday, June 24, 2014 11:48 AM
To: Lourigan, Joseph J - DNR
Subject: Monitoring from landfill sites

I don't think it is good policy to lessen monitoring seepage from landfill sites. Careful monitoring has lead to better quality water for drinking and recreational purposes. Helga Guequierre

Lourigan, Joseph J - DNR

From: Linda Shepard <lshepard9232@gmail.com>
Sent: Tuesday, June 24, 2014 12:45 PM
To: Lourigan, Joseph J - DNR
Subject: monitoring of closed landfill

I received a link about reducing or terminating monitoring at waste landfills from Adam Hogan DNR. We have a landfill in Columbia County on Hwy 16 being monitored by Stantec at the present time. This landfill was closed about 32 years ago and we have not had any problems in all those years. We would like to be considered if this goes thru to closing this landfill.

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SUBJECT: WM Technical Comments to the draft Reducing or Terminating Groundwater Monitoring at Solid Waste Landfills" WDNR Draft)

REVIEW TEAM: Terry Johnson, Mike Caldwell, Bill Schubert, Gerard Hamblin and Dan Leclaire and Ray Seegers

We appreciate the opportunity to comment of this important document as practitioners in Wisconsin as well as offering some national perspective as well.

General Comments:

Frequency Reduction Basis – The document contains some excellent points about use of existing groundwater monitoring data, source considerations and considerations of risk to human health and the environment in determining groundwater sampling frequency. It would be helpful and improve the guidance if some additional technical considerations were similarly included, such as:

1. Potential Source factors including other monitoring programs such as lysimeters.
2. Site specific and monitoring zone specific hydrogeologic conditions including relative permeability of each monitored zone.
3. Sample independence – statistical comparisons are predicated upon sample independence. In other words, too frequent monitoring can violate this principle as we are essentially sampling the same groundwater during consecutive events.

Applicability – The guidance indicates that due to NR 507 that frequency reductions below semi-annual cannot apply to Subtitle D landfills. In accordance with 40 CFR §258.54, "the Director of an approved State may specify an appropriate alternative frequency for repeated sampling and analysis of Appendix I constituents, or (an) alternative list.....The alternative frequency during the active life (including closure) shall be no less than annual." Subtitle D rules go on to state that site-specific geology, flow rates, time of travel, and resource value of the aquifer should be the basis for the alternative frequency. It may be advantageous to include potential reductions at Subtitle D landfills and it is our understanding that these reductions if technically defensible could be undertaken consistent with NR 507 using a staggered monitoring schedule. There are multiple scenarios for which these reductions would be warranted and acceptable. Below are a few examples:

Example 1 - Based upon the site-specific flow conditions, sample upgradient wells annually and downgradient wells semi-annually since the background data set is based upon a pooling of data that is not sensitive to subtle changes that occur over six (6) months in most cases.

Example 2 - Alternately, again if technically justified, downgradient monitoring could continue on a semiannual basis for key wells (i.e defined as wells located within the most

permeable formations) but the frequency could be reduced to annual for wells more distant or wells completed in zones with slower groundwater movement.

Example 3 – Depending on groundwater flow conditions including time-of-travel, sample a portion (perhaps half) of the wells on a semi-annual (or even annual) basis. In the case where a glacial till overlies a sand outwash deposit, sample the glacial till wells on an annual basis if groundwater flow velocity can be classified as "slow". The key is to identify sites where groundwater moves slow and the potential for a contaminant to move off-site between sampling events is not possible.

General Guidelines - The guidance suggests a simple framework that allows some specific landfills to change frequency from quarterly to semi-annual. However, it would be useful to make the guidance more helpful to the user, and perhaps more defensible in application, if it included more site specific provisions as described above. The Subtitle D reference is clear that more flexibility can be allocated to closed landfills therefore a time-of-travel and risk based frequency and a confirmation monitoring based duration would be defensible and provide further clarity to the owner/operators.

Other Clarifications – While we generally that agree waste volume could impact the risk profile of an unlined site, site specific hydrogeologic considerations are more important and we do not agree with this presumption for modern engineered landfills. Regarding the criteria on proximity to private wells, the gradient position (i.e., whether downgradient or not) is also important to consider.

Parameter Optimization – The WDNR guidance is silent on another key point on monitoring efficiency and long-term cost management, detection monitoring parameter optimization. We sample many parameters that do not add value to our programs and/or are redundant. Optimization involves identification of the best indicator parameters and tailoring the program to focus on these key indicators. Reference to the ASTM standard on the subject (D 7045-04) would be useful if WDNR also acknowledges their willingness to consider such a request should the owner/operator have the data necessary to support the protectiveness of the change. We have extensive experience in applying the ASTM approach in other jurisdictions to maintain a high level of groundwater protection at reduced cost.

Termination of Groundwater Monitoring – The guidance document highlights examples of site conditions where future groundwater contamination is "unlikely" and therefore termination of groundwater monitoring may be easier for WDNR to concur. Examples include:

- 5 years of GW monitoring data with no increasing trends or concentrations > preventative action limits (PALs)
- No active leachate and/or gas extraction system
- Waste volumes are "small"
- Well maintained cap
- Few private wells located near the landfill

- Hydrogeologic setting suitable for natural attenuation
- Up to down chemistry is similar
- Exceedances of a PAL is intrinsic to background and do not pose a threat to HHE
- DNR concurs that PALs will not be exceeded beyond the DMZ in the future

It is unclear why the absence of active leachate and/or gas extraction systems would be an indicator that future groundwater contamination is unlikely, unless the guidance is implying that an evaluation has been conducted that concludes that active leachate and gas control is no longer required to protect HHE. This clarification would be useful as this would more directly tie termination of groundwater monitoring to the Organic Stability Rules (OSR).

WDNR has not formally accepted the tenants of a functional stability model to determine the duration of groundwater monitoring. In a functional stability model, the O/O could assess conditions in leachate, simulate a release and determine (based upon a dilution model and TOT) whether such a release would pose a threat at a POE. In short, confirmation monitoring under a functional stability objective would ensure that a PAL is not exceeded beyond the DMZ in the future. This functional stability objective is the last bullet highlighted by WNDR, but without clarity on how to make such a determination. Thus, a recommendation to tie groundwater-monitoring duration as a confirmation-monitoring program linked to the OSR should be considered for applicable landfill sites. For the smaller C&D landfills originally targeted by WDNR that might not have an LCRS, therefore would not readily have the data to complete such an evaluation.