

## NR 716 Site Investigations

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**NR 716.01 Purpose.** The purpose of this chapter is to ensure that site investigations provide the information necessary to define the nature, degree and extent of contamination, define the source or sources of contamination, determine whether any interim actions, remedial actions, or both are necessary at the site or facility, and allow an interim or remedial action option to be selected that complies with applicable environmental laws. Nothing in this chapter shall be construed to require plans or reports that are more detailed or complex than is justified by the known scope of contamination or the complexity of the site or facility. This chapter is adopted pursuant to ss. 227.11 (2), 287.03 (1) (a), 289.06, and ch. 292.11, 292.15 and 292.31, Stats.

**Note:** The following portions of 40 CFR part 280 have been included in the text of this chapter: portions of s. 280.34 (a) (3), portions of s. 280.63 (a) and (b) and s. 280.65 (b).

**NR 716.02 Applicability. (1)** This chapter applies to all site investigations required under s. NR 716.05 and conducted by:

(a) The department under the authority of sch. 292.11 or 292.31, Stats. In this chapter, where the term “responsible parties” appears, it shall be read to include “the department” where department-funded response action is being taken.

(b) Responsible parties at sites, facilities or portions of a site or facility that are subject to regulation under sch. 292.11 or 292.31, Stats., regardless of whether there is direct involvement or oversight by the department.

**Note:** This chapter does not apply to site assessments undertaken for the sole purpose of gathering information prior to knowledge or discovery of contamination. However, upon the discovery of a discharge of a hazardous substance during a site assessment, s. 292.11, Stats., and ch. NR 706 require the responsible party to immediately notify the department of the discharge.

(c) Persons undertaking actions in order to obtain the liability exemption under s. 292.15, Stats. In this chapter, where the term “responsible parties” appears, it shall be read to include “the purchaser voluntary party” or “person under contract with the purchaser voluntary party” where an action is being taken to comply with s. 292.15, Stats.

(d) Other persons seeking closure under NR 726.

**(2)** The department may exercise enforcement discretion on a case-by-case basis and choose to regulate a site, facility or a portion of a site or facility under only one of a number of potentially applicable statutory authorities. However, where overlapping restrictions or requirements apply, the more restrictive provision controls. The department shall, after receipt of a request from the responsible parties, provide a letter indicating which regulatory program or programs the department considers to be applicable to a site or facility.

**Note:** Sites, or facilities or portions of a site or facility that are subject to regulation under sch. 292.11 or 292.31, Stats., may also be subject to regulation under other statutes, including the solid waste statutes in ch. 289, Stats., or the hazardous waste management act, ch. 291, Stats., and the administrative rules adopted pursuant to those statutes. In addition, federal authorities such as CERCLA, RCRA, or TSCA may also apply to a site or facility or portions of a site or facility. One portion of a site or facility may be regulated under a different statutory authority than other portions of that site or facility.

**Note:** Persons who wish to conduct response actions that will ~~meet~~ be consistent with the requirements of CERCLA and the National Contingency Plan (NCP) may request that the department enter into a contract with them pursuant to s. 292.31 or a negotiated agreement under s. 292.11(7)(d), Stats. However, a CERCLA-quality response action will likely require compliance with additional requirements beyond those contained in chs. NR 700 to 72654 in order to ~~satisfy~~ be consistent with CERCLA and the NCP.

**NR 716.03 Definitions.** In this chapter:

(1) "Batch of samples" means a group of samples collected during one discrete sampling event and stored and transported in a single shipping container, regardless of the number of samples in the group.

(2) "Field rinse blank" means a sample of water which, prior to use, is known to be free of contaminants, and which is processed through the sampling equipment in the field in the same manner as the actual water sample to determine if field procedures introduce contaminants into the samples. This is also known as a "rinse blank."

(3) "Immunoassay" means a test for the presence or concentration of a substance that relies on the reaction of one or more antibodies with the substance.

(4) "Investigative waste" means all solid and liquid wastes and contaminated environmental media resulting from activities conducted during a site investigation, immediate action, interim action, remedial action, or a monitoring or sampling event at a site or facility. Investigative wastes include soil from drill cuttings; drilling fluids; contaminated water from construction, purging, development and sampling of monitoring wells; and wash waters used during sampling or decontamination activities.

(5) "~~Lithologic~~" ~~means based on the physical characteristics of a rock.~~

(6) "Piezometer" has the meaning specified in s. NR 141.05(30).

**Note:** Section NR 141.05 (30) defines "piezometer" as "a groundwater monitoring well, sealed below the water table, installed for the specific purpose of determining either the elevation of the potentiometric surface or the physical, chemical, biological or radiological properties of groundwater at some point within the saturated zone or both."

(7) "Potentiometric surface" has the meaning specified in s. NR 141.05 (31).

**Note:** Section NR 141.05 (31) defines "potentiometric surface" to mean "an imaginary surface representing the total head of groundwater and is the level to which water will rise in a well."

(8) "Replicate sample" has the meaning specified in s. NR 149.03 (2770).

**Note:** Section NR 149.03 (27 70) defines "replicate sample" to mean " 2 or more substantially equal aliquots ~~taken from the same sampling location and analyzed independently for the same constituent~~ parameter." This is also known as a "duplicate."

(8) "Responsible parties" means, in this chapter, those parties defined under s. NR 700.03(51) as well as those parties identified under s. NR 716.02(1).

(9) "Temperature blank" has the meaning specified in s. NR 149.03(15)(c).

**Note:** Section NR 149.03(15)(c) defines "temperature blank" to mean ~~means a water sample container, of at least 40 ml. capacity, filled with water and transported with each shipment of collected samples which undergoes the same cooling procedure used for the samples for analysis, but which is only checked to determine the temperature of the~~ other samples in the shipment upon arrival at the a laboratory.

(10) "Trip blank" ~~has the meaning specified in s. NR 149.03(32).~~

**Note:** Section NR 149.03 (32) defines "trip blank" to mean ~~s~~ "a sample of reagent grade water which is used to determine possible contamination of samples from volatile organic chemicals while in transit to and from the laboratory."

(11) "Water table observation well" has the meaning specified in s. NR 141.05 (46).

**Note:** Section NR 141.05 (46) defines "water table observation well" to mean "any groundwater monitoring well, in which the screen or open borehole intersects a water table, which is installed for the specific purpose of determining either the elevation of the water table or the physical, chemical, biological or radiological properties of groundwater at the water table or both."

**NR 716.05 General.** ~~(1) Responsible parties shall conduct a site investigation that meets the requirements of this chapter and s. NR 746.05, for discharges of petroleum products from petroleum storage tanks.~~ When site-specific or facility-specific information indicates that soil, sediment, groundwater, surface water, air or other environmental media at a site or facility may have become contaminated, persons identified under sub. NR 716.02(1) shall conduct a site investigation consistent with this chapter. Unless sub. (2) is applicable, responsible parties shall use the factors in s. NR 708.09 (1) (a) through (n) and (2) (a) through (c) to determine whether or not a site investigation is necessary.

**(2)** A site investigation is not required of the responsible parties at a site or facility, if:

(a) After notification to the department of a hazardous substance discharge in accordance with ch. NR 706, the department determines that no further action is required of the responsible parties, based on the factors in s. NR 708.09 (1) and (2).

(b) After completion of an immediate action, the department determines that no further action is required of the responsible parties, based on the factors in s. NR 708.09 (1) and (2).

**Note:** Department guidance on conducting site investigations is available. The publications *Guidance for Conducting Environmental Response Actions and Leaking Underground Storage Tank Analytical Guidance* may be obtained by contacting the Bureau of Remediation and Redevelopment, Public Information Requests, P.O. Box 7921, Madison, WI 53707. The appropriate review fee specified in ch. NR 749 must accompany any request for the department to review a specific document.

**NR 716.07 Site investigation scoping.** Prior to conducting the field component of a site investigation required under s. NR 716.05, responsible parties shall evaluate all of the following relevant items, considering the location of the site or facility, to ensure that the scope and detail of the field investigation are appropriate to the complexity of the site or facility:

**(1)** History of the site or facility, including industrial, commercial or other land uses that may have been associated with one or more hazardous substance discharges at the site or facility.

**(2)** Knowledge of the type of contamination and the amount of the contamination.

**(3)** History of previous hazardous substance discharges or environmental pollution.

**(4)** Environmental media affected or potentially affected by the contamination.

**(5)** Location of the site or facility, and its proximity to other sources of contamination.

**(6)** Need for permission from property owners to allow access to the site or facility and to adjacent or nearby properties.

**(7)** Potential or known impacts to receptors, including public and private water supplies; buildings and other cultural features; and utilities or other subsurface improvements. This evaluation shall include mapping the location of all water supply wells within a 1,200 foot radius of the outermost edge of contamination.

**(8)** Potential for impacts to any of the following:

(~~b~~**a**) Species, habitat or ecosystems sensitive to the contamination.

(~~e~~**b**) Wetlands, especially those in areas of special natural resource interest as designated in s. NR 103.04.

(~~d~~**c**) Outstanding resource waters and exceptional resource waters as defined in ss. NR 102.10 and 102.11.

(~~e~~**d**) Sites or facilities of historical or archaeological significance.

**Note:** Information on sites or facilities of historical or archeological significance may be found at the following State Historical Society websites:

Wisconsin National Register of Historic Places:

<http://www.wisconsinhistory.org/hp/register/welcome.asp>

Office of the State Archeologist: <http://www.wisconsinhistory.org/archaeology/osa/>.

**(9)** Potential interim and remedial actions applicable to the site or facility and the contamination.

**(10)** Immediate or interim actions already taken or in progress, including any evaluations made of whether an interim action is needed at the site or facility.

**(11)** Any other items, including climatological conditions and background water or soil quality information, that may affect the scope or conduct of the site investigation.

**(12)** The need to gather data to determine the hydraulic conductivity of materials where contaminated groundwater is found ~~and, for sites with petroleum-product contamination~~

~~discharged from a petroleum storage tank, to determine whether the site satisfies the risk screening criteria in s. NR 746.06 and the closure criteria in s. NR 746.07 or 746.08.~~

**NR 716.09 Site investigation work plan. (1) GENERAL.** Unless otherwise directed by the department, in cases where a site investigation ~~is~~ required under s. NR 716.05, responsible parties shall submit a work plan to the department within 60 days of receiving notification that a site investigation is required, describing the intended scope and conduct of a field investigation ~~if the site or facility is classified as complex under s. NR 700.09 (2) or if the responsible party chooses to proceed with the complex site process under s. NR 700.11 (2).~~

**(2) CONTENTS.** The work plan shall include all of the following information, unless otherwise directed by the department:

(a) Site name, address, and location by quarter-quarter section, township, range and county, and the location information specified in s. NR 716.15(5) (d) ~~or a more precise location description if necessary to adequately define the location of the site or facility.~~

(b) Name and address of the responsible party or parties, and name and address of all consultants or contractors involved in the response action.

(c) Site location map, consisting of the applicable portion of a 1:24,000-scale topographic quadrangle published by the United States geological survey with the name of the quadrangle indicated, and a site layout map to approximate scale depicting the layout of buildings, roads, discharge location and other relevant features of the site.

(d) Information gathered during scoping of the project, including the applicable items in s. NR 716.07.

(e) Basic information on the physiographical and geological setting of the site necessary to choose sampling methods and locations, including:

1. The existing topography, including prominent topographic features.
2. The surface water drainage patterns and significant hydrologic features, such as surface waters, springs, surface water drainage basins, divides, wetlands and whether the site lies within a floodplain or floodway.
3. Texture and classification of surficial soils.
4. General nature and distribution of geologic materials, including the thickness and type of unconsolidated materials and the type and nature of bedrock.
5. General hydrogeologic information.
6. Potential hazardous substance migration pathways.

(f) Sampling and analysis strategy to be used during the field investigation, including:

1. A description of the investigative techniques to be used to characterize the site or facility.
2. Identification on a site layout map of the locations, both planimetric and vertical, from which samples of environmental media will be obtained. Where locations cannot be specified in advance, the work plan shall include a description of the strategy to be used for determining these locations in the field.
3. A description of sampling methods to be used, including methods for preserving and delivering samples.
4. An itemization of the parameters for which samples will be analyzed, as well as the analytical methods to be used and their method detection limits.
5. A description of quality control and quality assurance procedures to be used, including the items specified in s. NR 716.13.
6. A description of the procedures to be used to prevent cross-contamination among samples.
7. A description of the type of investigative wastes that will be generated during the site investigation and how they will be collected, stored, transported and treated or disposed of.
8. A discussion of how the sampling and analysis results will be related to results of any previous investigations at the site or facility, and how the results will be used to determine the degree and extent of the contamination and the selection of a remedial action option including, where appropriate, natural biodegradation attenuation.

(g) A description of other procedures to be used for site management, including erosion control and repair of soil or ground disturbance.

(h) A schedule for conducting the field investigation and reporting the results to the department.

- (3) DEPARTMENT REVIEW OF SUBMITTED WORK PLANS.** (a) The department may instruct responsible parties to proceed without departmental review of work plans submitted under this section.
- (b) Responsible parties that are not instructed to proceed under par. (a) shall wait before initiating the field investigation until the department has approved or conditionally approved the work plan, except that if the department has not reviewed the work plan within 630 days after its receipt by the department, the responsible parties ~~may~~**shall** proceed with the field investigation.
- (c) If the department disapproves a work plan submitted under this section, the department shall provide to the responsible parties, in writing, the basis for disapproval and a deadline for providing a revised work plan.
- (d) The lack of a response from the department, after the department's receipt of a work plan, may not be construed to mean that the department has approved the work plan.

**NR 716.11 Field investigation. (1)** Responsible parties shall conduct a field investigation as part of each site investigation required under this chapter, unless the department directs otherwise.

**(2)** The field investigation shall be conducted in accordance with a work plan approved or conditionally approved by the department, unless the department has directed the responsible parties to proceed with a field investigation without department review of the investigation work plan.

(a) The field investigation shall be initiated within 60 days of submittal of the work plan.

(b) In cases where the responsible party pays a fee for department review of the work plan, the field investigation shall be initiated within 60 days after department approval of the work plan.

**(3)** The purposes of the field investigation shall be to:

(a) Determine the nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in all affected media.

(b) Provide sufficient information to permit evaluation of interim options pursuant to ch. NR 708, and remedial action options pursuant to ch. NR 722, and to permit a determination to be made regarding whether any of the interim or remedial action options require a treatability study or other pilot-scale study.

(c) Provide sufficient information to determine the hydraulic conductivity of materials where contaminated groundwater is found ~~and, for sites with petroleum-product contamination discharged from a petroleum storage tank, determine whether the site satisfies the risk screening criteria in s. NR 746.06 and the closure criteria in s. NR 746.07 or 746.08.~~

(d) Provide an estimate, along with all necessary supporting information, of the mass of contamination in the source area. This includes, but is not limited to sites involving free product or where natural attenuation is considered for part of the remedy.

**Note:** Methods and examples for estimating mass in the source zone, can be found in the following guidances: RR 699, Understanding Chlorinated Hydrocarbon Behavior in Groundwater: Investigation, Assessment and Limitations of Monitored Natural Attenuation at <http://dnr.wi.gov/org/aw/rr/archives/pubs/RR699.pdf>; and RR 614, Guidance on Natural Attenuation for Petroleum Releases, at <http://dnr.wi.gov/org/aw/rr/archives/pubs/RR614.pdf>.

**(4)** Responsible parties shall extend the field investigation beyond the property boundaries of the source area as necessary to fully define the extent of the contamination. If the responsible parties are unable to complete the required investigation beyond the source property because a property owner refuses access, the responsible parties shall notify the department within 30 days of the refusal, and shall document in writing the efforts undertaken to gain access when requested by the department.

**(5)** The field investigation shall include an evaluation of all of the following items:

(a) Potential pathways for migration of the contamination, including drainage improvements, utility corridors, bedrock and permeable material or soil along which vapors, free product or contaminated water may flow.

(b) The impacts of the contamination upon receptors.

(c) The known or potential impacts of the contamination on any of the resources listed in s. NR 716.07 (8) that were identified during the scoping process as having the potential to be affected by the contamination.

(d) Surface and subsurface rock, soil and sediment characteristics, including physical, geochemical and biological properties that are likely to influence the type and rate of contaminant movement, or that are likely to affect the choice of a remedial action.

(e) The extent of contamination in the source area, in soil and saturated materials, and groundwater.

**Note:** The intent of this requirement is to collect samples in the general area where the contaminant was released, where the concentrations are generally expected to be the greatest, and to determine the presence of non-aqueous phase liquids, including but not limited to samples from the smear zone. For further information on the smear zone, copies of the department's guidance "Smear Zone Contamination" may be obtained by accessing the following web site: <http://dnr.wi.gov/org/aw/rr/archives/pubs/RR712.pdf> or from any regional office of the department, or by writing to the Department of Natural Resources, Bureau for Remediation and Redevelopment, P. O. Box 7921, Madison, Wisconsin 53707. This requirement is not intended to address sampling of landfill waste materials.

(f) The extent, both vertically and horizontally, of groundwater contamination. Piezometers shall be used to determine the vertical extent of contamination, as appropriate to the situation.

**Note:** The use of piezometers may not be appropriate for all situations, including within the source area, or where a documented upward gradient exists downgradient of a source area.

(6) Responsible parties shall manage investigative wastes in a manner that will not pose a threat to public health, safety or welfare or the environment, and which is consistent with state and federal regulations.

(7) Responsible parties shall label all drums containing investigative wastes, including but not limited to drill cuttings and purge water, with the Bureau for Remediation and Redevelopment Tracking System activity number for the site, the site name, boring or well number, initial date of collection and the contents.

**NR 716.13 Sampling and analysis requirements. (1)** Responsible parties shall use laboratory analyses of environmental media samples which are collected, handled and analyzed in compliance with subs. (2) to ~~(4)~~ 17 to confirm the nature and extent and evaluate the impacts of contamination, if a field investigation is required under s. NR 716.11 (1). Analytical methods used shall be suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the samples to be tested.

**Note to reader:** the following 2 subsections have been moved to later in this section and modified.

~~(2) Responsible parties shall ensure that drinking water samples are collected, handled and analyzed according to the procedures specified in ch. NR 809.~~

~~(3) Responsible parties shall ensure that samples other than drinking water are collected, handled and analyzed according to the procedures specified in "SW-846: Test Methods for Evaluating Solid Waste", November 1986, including December 1987 and November 1990 updates, published by the U.S. EPA, unless the department approves the use of an alternative procedure. The department may approve the use of an alternative procedure from one of the authoritative sources listed in s. NR 149.03 (5), an alternate test procedure approved by the U.S. EPA, or, if the department determines that an appropriate procedure is neither available from "SW-846: Test Methods for Evaluating Solid Waste" nor from one of the authoritative sources listed in s. NR 149.03 (5), from another source.~~

~~**Note:** Copies of "SW-846: Test Methods for Evaluating Solid Waste" are available for inspection at the offices of the department of natural resources, the secretary of state, and the revisor of statutes. Copies may be obtained from the Government Printing Office, Room 190, Federal Building, 517 East Wisconsin Avenue, Milwaukee, WI 53202.~~

~~(4) All chemical and physical analyses for which a certification or registration test category is available under ch. NR 149 shall be conducted by a laboratory certified under ch. NR 149 for that test category.~~

~~(5)~~ (5) Responsible parties may use non-laboratory methods of sample analysis, including field screening with a photoionization detector or flame ionization detector, analysis with a field gas chromatograph, geophysical or downhole probe surveying, non-certified mobile laboratory analysis, immunoassays and other appropriate methods, to supplement the information derived from laboratory analysis of samples. If non-laboratory methods are used at a location from which a laboratory sample is collected, responsible parties shall use separate samples for the non-laboratory and the laboratory analyses, unless the target compound is not subject to loss or alteration through sample handling.

~~(64)~~ All soil samples obtained during the field investigation for the purpose of defining the degree and extent of the contamination shall be discrete, not composite, samples, unless the department explicitly approves in advance composite sampling for a specific site situation.

**Note to reader:** the following 4 subsections have been moved to later in this section and modified. In addition, a portion of (9) has been moved to s. NR 716.14(1) and modified. Subsection (5) was moved from NR 700.13(3) and modified.

~~(7)~~ Responsible parties shall inspect monitoring wells installed for field investigations conducted under this chapter at least annually to determine whether they are providing a conduit to the subsurface, and shall take action to repair or abandon the well if necessary in accordance with ch. NR 141.

~~(8)~~ Responsible parties shall measure and record to the nearest 0.01 foot the static water level elevation in each groundwater monitoring well prior to obtaining a groundwater sample from the well. The measurement point shall be the top of the well casing and shall be identified on the well itself if the top of the casing is not level.

~~(9)~~ Where site investigation data or other information indicate it is appropriate, or when directed to do so by the department, responsible parties shall make a good faith effort to sample public or private water supply wells as part of a regular monitoring program or to determine the extent of groundwater contamination, or both. Responsible parties shall report all water supply well sampling results to the department within 10 days after receiving the sampling results. The report shall include a preliminary analysis of the cause and significance of any contaminant concentrations observed in the samples and an identification of any substances that attain or exceed ch. NR 140 preventive action limits, as well as any other substances observed in the samples for which there are no ch. NR 140 groundwater quality standards. Private and public water supply wells to be sampled shall include:

- ~~(a)~~ Those wells that are known or suspected to be affected by the groundwater contamination.
- ~~(b)~~ Other wells that the department determines have the potential to be affected by the groundwater contamination.

~~(10)~~ If the responsible parties are unable to sample a public or private well because the property owner refuses access, the responsible parties shall notify the department within 30 days of the refusal, and shall document in writing the efforts undertaken to gain access when requested by the department.

~~(5)~~ Maximum holding times for soils shall be in accordance with the sampling method, sample storage container and analytical methods used.

~~(116)~~ Responsible parties shall provide for the following quality control and quality assurance procedures, at a minimum, when collecting samples for laboratory analysis for a field investigation conducted under this chapter:

(a) Chain of custody, which shall be documented in a format specified by the department, from the time of sample collection to the receipt of the sample by the analytical laboratory.

**Note:** Copies of the chain-of-custody format may be obtained at [http://dnr.wi.gov/org/aw/rr/archives/pubs/4100\\_145.pdf](http://dnr.wi.gov/org/aw/rr/archives/pubs/4100_145.pdf) or from Public Information Requests, Bureau of ~~for~~ Remediation and Redevelopment, 101 S. Webster Street, P.O. Box 7921, Madison, WI 53707.

(b) For soil samples, one temperature blank for every ~~batch of samples~~ shipping container of samples that require cooling for preservation, unless samples are received by the laboratory on ice and a temperature of no greater than 4 6° C is maintained until their receipt by the laboratory, unless another temperature is required by the analytical method used.

(c) For water samples:

1. One replicate sample for every 10 or less samples.
2. One ~~field blank~~ field rinsate blank for every 10 or less samples, unless dedicated sampling equipment is used to prevent cross-contamination.
3. One trip blank for each batch of samples that will be analyzed for volatile organic chemicals.
4. One temperature blank for every ~~batch~~ shipping container of samples that require cooling for preservation, unless samples are shipped on ice and a temperature of no greater than 4 6°C is maintained until their receipt by the laboratory.

(d) Decontamination of all sampling instruments between each sampling event, unless dedicated or disposable sampling devices are used in a manner that prevents cross contamination or other unintended contamination of samples.

~~(127)~~ Responsible parties shall ensure that the following items are documented during the field investigation and are made available to the department upon request:

(a) Procedures for sampling and all other routine activities associated with the site investigation.  
(b) A log of all routine and non-routine maintenance and calibrations performed on all instruments used during the field investigation.

(c) Field notes describing in detail the sequence of activities that took place during the field investigation.

**(8)** For water samples, the reporting limit for volatile organic compound analysis and petroleum volatile organic compound analysis shall be the limit of detection for the analytical method used. For soil samples, the reporting limit for volatile organic compound analysis and petroleum volatile organic compound analysis shall be the method detection limit for the analytical method used.

**Note:** Paragraph NR 140.16(2) (c) requires that the analytical method selected meet one of the following criteria: 1) has a limit of detection and limit of quantitation below the preventive action limit or 2) produces the lowest available limit of detection and limit of quantitation if the limit of detection and limit of quantitation are above the preventive action limit. In addition, subsection NR 140.14(3) specifies whether a standard has been attained or exceeded if a preventive action limit or enforcement standard is equal to or less than the limit of quantitation.

**Note:** Chapter NR 720 specifies whether a soil cleanup standard has been exceeded if the standard is at or below the limit of quantitation.

**(29)** Responsible parties shall ensure that drinking water samples are collected, handled and analyzed according to the procedures specified in ch. NR 809.

**(10)** Responsible parties shall ensure that groundwater samples are collected and handled according to the procedures specified in s. NR 140.16(1), unless the department approves the use of an alternative procedure. The department may approve the use of an alternative procedure from one of the authoritative sources listed in s. NR 149, Appendix III, or an alternate test procedure approved by the U.S. EPA, or, if the department determines that an appropriate procedure is not available, from another source. Responsible parties shall select an analytical method that is suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the sample to be tested.

**Note:** Suitable analytical methods for VOCs and PVOCs in groundwater include EPA methods 5030/8021, 5030/8260, EPA Method 8310 for PAHs, EPA method 3510/8082 or 3520/8082 for PCBs, EPA Method 3020/7421 or 3020/6020 for Pb, EPA Method 3020/7131 or 3020/7130 for Cd, EPA Method 1664 for oil and grease and EPA Method 160.2 for Total Suspended Solids.

**Note to reader:** The following subsection was moved from sub. NR 700.13 (2).

**(11) VOLATILE ORGANIC COMPOUNDS** (a) Soil samples collected for analysis of volatile organic compounds for compliance with chs. NR 700 to 754 shall be preserved immediately after collection to minimize volatilization of contaminants from the sample to the greatest extent possible. Preservation techniques used shall be according to the analytical method to be used. Sampling techniques shall be used that minimize volatilization from the sample. Extraction techniques shall be according to the analytical method selected. Analytical methods used shall be suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the samples to be tested.

**Note:** Suitable preservation, extraction and analytical methods include those found in the "Modified GRO, Method for Determining Gasoline Range Organics", and in method SW 5035A in "Test Methods for Evaluating Solid Waste (SW-846)". Other techniques may be found in the List of Authoritative Sources, ch. NR 149, Appendix III.

**(312)** Responsible parties shall ensure that other samples taken for analysis other than drinking water are collected, handled and analyzed according to the procedures specified in "SW-846: Test Methods for Evaluating Solid Waste", ~~November 1986, including December 1987 and November 1990 updates particularly "The Third Edition of SW 846, as amended by Final Updates I, II, IIA, IIB, III, IIIA, and IIIB"~~, published by the U.S. EPA, unless the department approves the use of an alternative procedure. The department may approve the use of an alternative procedure from one of the authoritative sources listed in s ~~ch. NR 149.03 (5), Appendix III~~, an alternate test procedure approved by the U.S. EPA, or, if the department determines that an appropriate procedure is neither available from "SW-846: Test Methods for Evaluating Solid Waste" nor from one of the authoritative sources listed in s ~~ch. NR 149.03 (5), Appendix III~~, from another source.

**Note:** Copies of "SW-846: Test Methods for Evaluating Solid Waste" may be accessed at the following web site: <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>. ~~are available for inspection at the offices of the department of natural resources, the secretary of state, and the revisor of statutes. Copies may be obtained from the Government Printing Office, Room 190, Federal Building, 517 East Wisconsin Avenue, Milwaukee, WI 53202.~~

(13) Responsible parties shall collect samples and provide an analysis for the geochemical indicators and parameters, where natural attenuation is potentially a remedy or part of a remedy. These may include, but are not limited to dissolved oxygen, nitrate, dissolved manganese, total and ferrous iron, sulfate and methane, alkalinity, oxidation reduction potential, pH, temperature and conductivity.

(714) (a) Responsible parties shall inspect monitoring wells installed for field investigations conducted under this chapter at least annually to verify the integrity of the well labels, lock and seal, and to determine whether they the wells are providing a conduit to the subsurface, and shall take action to repair or abandon the well if necessary in accordance with ch. NR 141.

(b) Flush mounted wells shall include a magnet placed in the void between the cover and the annular space seal. In cases where flush-mounted wells are not used, wells installed in areas potentially subject to damage from vehicle traffic shall include appropriate protective traffic posts next to the well.

Note: Traffic posts can vary in design. Normally, properly anchored concrete filled metal posts should be used to protect wells. The magnet may aid in locating wells for abandonment.

(815) Responsible parties shall measure and record to the nearest 0.01 foot the static water level elevation in each groundwater monitoring well prior to obtaining a groundwater sample from the well. The measurement point shall be the top of the well casing and shall be identified on the well itself if the top of the casing is not level.

Note: Subsection NR 141.065(2) requires that the top of the well casing be referenced to the nearest benchmark for the national geodetic survey datum to an accuracy of 0.01 feet.

(916) Where site investigation data or other information indicate it is appropriate, or when directed to do so by the department, responsible parties shall make a good faith effort to sample public or private water supply wells as part of a regular monitoring program or to determine the extent of groundwater contamination, or both. Private and public water supply wells to be sampled shall include:

(a) Those wells that are known or suspected to be affected by the groundwater contamination.

(b) Other wells that the department determines have the potential to be affected by the groundwater contamination.

(1017) If the responsible parties are unable to sample a public or private well because the property owner refuses access, the responsible parties shall notify the department within 30 days of the refusal, and shall document in writing the efforts undertaken to gain access when requested by the department.

#### **NR 716.14 Sample Results Notification Requirements. (1) SAMPLES FROM WATER SUPPLY WELLS.**

Responsible parties shall report all water supply well sampling results to the department and to the well owner, and occupant as applicable, within 10 business days after receiving the sampling results. The report to the department shall include the Wisconsin unique well number for drinking water wells, a preliminary analysis of the cause and significance of any contaminant concentrations observed in the samples and an identification of any substances that attain or exceed ch. NR 140 preventive action limits, as well as any other substances observed in the samples for which there are no ch. NR 140 groundwater quality standards. The responsible party shall notify both the remediation and redevelopment project manager and the regional drinking and groundwater specialist or water supply engineer of all water supply well sample results.

Note: The appropriate remediation and redevelopment project manager can be determined for the site in question at <http://dnr.wi.gov/org/aw/rr/brrts/index.htm>. The appropriate regional drinking and groundwater specialist or water supply engineer can be determined by viewing the staff listing at <http://www.dnr.state.wi.us/org/water/dwg/county.htm>.

Note: The department will provide information to well owners of the results of sampling in accordance with manual code 4822.1.

(2) SAMPLES FROM OTHER MEDIA. Responsible parties shall report all sampling results other than those for water supply wells, to the department and to the property owner, and occupants as appropriate, of the property from which the samples were collected, including the source property owner if the person conducting the investigation is not the property owner, within 10 business days of receiving the sample results.

(a) The report to the department shall include a preliminary analysis of the cause and significance of any contaminant concentrations observed in the sample, a list of names and addresses of those receiving a sampling notification, and the date of the sampling event and mailing.

(b) The written notification to an affected property owner, and occupant as appropriate, shall include information about how additional information may be obtained, in accordance with sec. NR 714.05 (5). The department may waive the notification of occupants in limited situations, upon request.

(c) In addition, the notification to the property owners, and occupants as appropriate, shall include all the following information, in a letter or using a form provided by the department. Information to be included in the notification includes but is not limited to:

1. responsible party name, address and phone number,
2. site name and source property address,
3. department BRRTS number,
4. department contact person name and phone number,
5. reason for sampling, which may include, but is not limited to routine sampling, and sampling to determine an immediate health concern, including but not limited to, the ingestion, inhalation and dermal contact pathways,
6. contaminant type,
7. sample type, which may include but is not limited to groundwater, soil, sediment, soil vapor, outdoor or ambient air, and indoor air,
8. a map showing the sampling locations, which meets the requirements of par. NR 716.15(4),
9. collection date, specific contaminant levels per location, and whether the sample results attain or exceed state standards. A data table shall be used when multiple sample results are included.
10. A copy of the results from the laboratory attached to the notification.

**Note:** Notification of sampling results is intended for those samples taken from a property including results from both routine and long-term monitoring and those of a more immediate health or welfare concern to a property owner, or occupant as appropriate. Examples of sampling to determine the presence of an immediate public health or welfare concern are from potable wells, indoor air, surface soil, and soil vapor beneath an occupied structure. "All sampling results" means the results that show detections of contaminants as well as those that do not show detections.

**Note:** Assistance in evaluating the impact and meaning of the sample results may be requested of the department project manager or drinking water staff, or from staff with the Division of Public Health, with the Department of Health Services.

**Note:** The notification to occupants is not intended for situations where there are multiple units or a frequent change in occupancy.

(3) The department may approve of a different notification schedule on a case-by-case basis.

**Note:** In cases where routine monitoring is conducted, and where results are not expected to be of immediate health or welfare concern, the department may consider other schedules, such as quarterly or with the semi-annual status reports to be sufficient.

(4) The responsible party shall take the actions necessary to ensure any new occupants are also informed of the pertinent information required under sub. NR 716.14(2)(c).

**NR 716.15 Site investigation report. (1) REPORT REQUIREMENTS.** (a) *Timeline. Simple site.* Unless otherwise directed approved by the department, ~~responsible parties shall include the site investigation report information with the final report and accompanying compliance letter for the response action in accordance with s. NR 700.11 (1) (b), if the site or facility meets the criteria for a simple site classification, in s. NR 700.09 (1).~~

~~(b) *Complex site.* If, however, the site or facility is classified as a complex site in accordance with s. NR 700.09 (2) or if the responsible party chooses to proceed with the complex site process, responsible parties shall submit:~~

~~1. A a site investigation report to the department within 360 days after completion of the field investigation and receipt of laboratory data report unless the site is exempt under s. NR 700.11 (2) (e), in which case site investigation data are required to be submitted with the site closure request.~~

~~2. A draft remedial options report meeting the requirements of ch. NR 722 within 30 days after completion of the report unless the site is exempt under s. NR 700.11 (2) (f), in which case the submittal of a remedial action options report is not required unless requested.~~

(b) *Number of copies.* Unless otherwise directed by the department, one paper copy and one electronic copy of the plan or report shall be submitted to the department.

**Note:** Electronic copies should be submitted in the Adobe Portable Document Format (PDF) on optical disk media. Guidance on electronic submittals can be accessed at <http://dnr.wi.gov/org/aw/rr/archives/pubs/RR690.pdf>.

**Note:** The department strongly recommends the use of 2-sided copies for the paper copy of the report, and the use of accordion folders for larger reports instead of 3-ring binders, to help address file space issues.

**(2)** REPORT CONTENTS. The site investigation report shall include all of the following information required under this subsection, and under subs. (3) through (6):

(a) *Cover letter.* A letter referencing the department's identification number for the site or facility and stating the purpose of the submittal and the desired department action or response.

~~(b) *Number of copies.* Unless otherwise directed by the department, 2 copies of the plan or report.~~

~~(e)~~ *Executive summary.* A brief narrative describing the site investigation results, conclusions and recommendations for future actions, and the certification required under s. NR 712.09.

~~(d)~~ *General information.* 1. Project title and purpose.

2. Name, address and telephone number of the present property owner, lessee, operator and any individual or company responsible for the contamination.

3. Name, address and telephone number of any consultants or contractors involved with the response action at the site or facility.

4. Site or facility name, address and location by quarter-quarter section, township, range and county, along with the Wisconsin Transverse Mercator coordinates for the site. The location of the property and the contamination shall be given in sufficient detail to allow department personnel to inspect the property and the contaminated area.

~~Note:~~ Additional requirements for reporting locations of monitoring wells are contained in ch. NR 141. The requirements for locating monitoring wells are contained in s. NR 141.065. Specifically regarding areal location, this section requires that the wells be shown on a plan map with a grid system that is located according to latitude and longitude, or according to a state plane coordinate system. The plan map must show the exact location of the installed well on a horizontal grid system which is accurate to within one foot.

5. Location map which meets the requirements of ~~par. (h)~~ sub. (4).

6. In addition to any other site layout maps, one site layout map which depicts the site's property boundaries, named and unnamed roads or access points, surface water features, underground utilities, buildings, public and private wells, land uses on adjacent properties and known and potential hazardous substance sources.

7. The geographic positions of all properties within and partially within the contaminated site boundaries, which have been directly located or interpolated from other features on a base map of 1:24000 scale or finer, or which were obtained using differentially corrected global positioning system data or another method of similar or superior accuracy that have been approved by the department. The geographic position data shall be obtained and submitted to the department in accordance with the requirements in ~~par. (k)~~ sub. (5) (d).

~~(e)~~ *Background information.* Descriptions of the following:

1. Activities or events at or near the site or facility which had the potential to affect public health, safety or welfare or the environment, including time, duration, type and amounts of hazardous substance discharges.

2. Any previous discharges or response actions and the relevant dates.

3. Response action activities to date, with references to any previous reports concerning response action activities on the site or facility.

4. Any other information relevant to the response action.

~~(f)~~ *Methods of investigation.* Descriptions of investigative techniques used to characterize the site or facility, including subsurface boring and probe methods; monitoring well construction, installation and development procedures; well and aquifer testing methods; modeling techniques; and sample collection, handling and analysis techniques. Where procedures were performed in accordance with methods described in a work plan for the same investigation that was previously submitted to the department or in exact accordance with published departmental guidance, the site investigation report may omit detailed descriptions by referring to the work plan or the department guidance in which the methods were described.

(g) ~~(3) Results~~ **RESULTS. Include in the site investigation report a** A detailed narrative description of the results of the site investigation, including all of the following:

1(a). The information collected during the scoping stage of the investigation conducted pursuant to s. NR 716.07.

2(b). A description of the sequence of activities that took place during the site investigation.

3(c). All field measurements, observations, and sampling data generated during the site investigation, including data from non-laboratory sample analyses. Laboratory data shall include laboratory name, location from which each sample was obtained, date each sample was obtained, date each sample was extracted and analyzed, analytical method used by the laboratory, parameters tested for, the method detection limit, the analytical result for each sample, and whether other compounds not specifically tested for were observed in significant quantities. Relevant and significant sample results and field measurements shall be compiled in tabular form and at corresponding sampling locations noted on a site layout map.

4(d). Where laboratory results are significantly inconsistent with field observations or non-laboratory method results, a clear evaluation of the reason for the inconsistency and an indication of whether resampling or additional quality control procedures are needed.

5(e). For sites or facilities with 3 or more water table observation wells, a discussion of the depth to the water table, groundwater flow directions, rates, and any variations. Reference the appropriate visual aids required under sub. (4). a map depicting the elevation of the water table and the apparent direction of groundwater flow, with additional water table maps as necessary to depict significant variations in water table elevation or groundwater flow direction.

6(f). A discussion of the stratigraphy of the site. Identify soil and rock types at the site and the contaminant source location. Include a description of moisture contents, high and low water table elevations, and the location of any smear zone. Reference the appropriate visual aids required under sub. (4). For sites or facilities with 2 or more soil borings, a geologic cross section depicting the stratigraphy of the site.

7(g). A discussion of the contaminants and impacts on each environmental medium. Reference the appropriate visual aids required under sub. (4). Isoconcentration maps of hazardous substance concentrations in each environmental medium, as appropriate to the scope and complexity of the site and where sufficient data are available to estimate meaningful isoeconcentrations.

8(h). Interpretations of the data generated at the site or facility sufficient to characterize the geologic and hydrogeologic characteristics of the site or facility, the areal and vertical degree and extent of hazardous substances in all environmental media, and the impacts of the contamination to all potential receptors.

9(i). The hydraulic conductivity of materials where contaminated groundwater is found ~~and, for sites with petroleum-product contamination discharged from a petroleum storage tank, interpretations of data necessary to determine whether the site satisfies all of the risk screening criteria in s. NR 746.06 and the closure criteria in s. NR 746.07 or 746.08.~~

(h) ~~Visual aids.~~ **(4) VISUAL AIDS. Include in the site investigation report** Maps, figures, tables, graphs and photographs that are necessary to clarify and support results and interpretations. Visual aids shall present information in legible formats, shall be referenced in the report text, and shall meet all of the following requirements:

1(a). General Requirements. Maps, plan sheets, drawings, cross sections and fence diagrams shall:

a1. Be of appropriate scale to show all required details with sufficient clarity.

b2. Have a figure number, title, north arrow, legend of all symbols used, contain horizontal and vertical scales, specify drafting or origination dates and indicate the source if not an original design.

Note: The source means the company or the author who created the visual aid.

c3. Use national geodetic survey data as the basis for all elevations.

d4. Use a distinguishing symbol, such as a dashed line or question mark, to depict inferred or questionable data.

e(b). Water table and potentiometric surface maps. For water table maps and potentiometric surface maps, depict water level elevations measured on the same day, indicate the date of measurement on the map, and indicate apparent flow direction.

1. For sites or facilities with 3 or more water table observation wells, include a map depicting the elevation of the water table and the apparent direction of groundwater flow, with additional water table maps as necessary to depict significant variations in water table elevation or groundwater flow direction.

2. For potentiometric surface maps, additionally depict measurements taken from piezometers with similar screen lengths that intersect the same geologic zone and depth, and indicate any vertical gradients as well as the location and type of any confining layers. For sites with 3 or more piezometers, include a potentiometric surface map, with the apparent direction of groundwater flow, with additional potentiometric maps as necessary to depict significant variation in levels or flow direction.

f.(c) Isoconcentration maps. For isoconcentration maps, depict the hazardous substance(s), concentrations and indicate the hazardous substance, the environmental medium, the date measured and the unit of measurement. Submit isoconcentration maps of hazardous substance concentrations in each environmental medium, as appropriate to the scope and complexity of the site and where sufficient data are available to estimate meaningful isoconcentrations. For groundwater, use the appropriate groundwater elevation map as the base map.

2.(d) Cross sections. For sites or facilities with 2 or more soil borings, include one or more geologic cross sections.

1. Cross sections shall include a reduced inset diagram of the site layout map indicating the location of the cross section transect, and shall indicate the dates of measurements, stratigraphy, screened intervals of monitoring wells and water table surface.

2. Include the locations of any confining units; the contaminant source location, vertical and horizontal extent of contamination in both soil and groundwater, and highest and lowest water table and piezometric elevations and screen lengths, as applicable.

3.(e) Tables. Tables shall meet all of the following requirements:

a1. Have Include a table number, title and an explanation of any footnotes marked in the body of the table.

b2. Include units of measurement when displaying measured data. When an environmental standard exists for the contaminant, the unit of measurement shall be the same as that used by the department to express the environmental standard.

c3. Indicate measurement or sample collection date when displaying measured data or data derived from sampling.

d4. Indicate which results equal or exceed environmental standards when displaying analytical results of tests on environmental media for which standards exist.

5. Indicate depth and soil type for soil sample summary tables.

6. For groundwater elevation tables, indicate each well's top and bottom screen elevation.

4(f) Photographs. Photographs shall be in color, of sufficient size to clearly represent the purpose of the photograph, and shall be accompanied labeled by the date, orientation and topic.

(ig) Well and borehole documentation. All of the following department forms, shall be used completed and included in the site investigation report, where applicable to the site or facility:

1. 4400-89, groundwater monitoring well information.

2. 4400-113A, monitoring well construction.

3. 4400-113B, monitoring well development.

4. 4400-122, soil boring log information.

5. 3300-5B, well/drillhole/borehole abandonment.

**Note:** Copies of these well and borehole documentation forms may be obtained from the Bureau of Remediation and Redevelopment, Public Information Requests, P.O. Box 7921, Madison, WI 53707 following internet site: <http://www.dnr.state.wi.us/org/water/dwg/gw/forms.htm>.

(j) (5) DEED AND LOCATIONAL INFORMATION. Legal descriptions and parcel identification numbers. All of the following information shall be included in the site investigation report for each property within or partially within the contaminated site boundaries:

1(a). A copy of the most recent deed, which includes the legal description.

2(b). A copy of the certified survey map or the relevant portion of the recorded plat map for those properties where the legal description in the most recent deed refers to a certified survey map or a recorded plat map.

~~3(c).~~ The parcel identification number(s) for each property if the county in which the property is located uses parcel identification numbers.

(k)d) *Geographic position.* All geographic position data shall be obtained and submitted to the department in the site investigation report in accordance with the following requirements:

1. 'Format.' For properties that are not more than 200 feet wide or long, a single point geographic position shall be obtained at least 40 feet within the boundaries of the property, or as close to the center of the property as possible if the property is less than 80 feet wide or long. For properties that are more than 200 feet wide or long, coordinates describing the approximate location of the property's boundaries, forming a polygon, shall be obtained.
2. 'Coordinate system.' Geographic position data shall be originally collected in Wisconsin Transverse Mercator Mercator '91 or projected onto Wisconsin Transverse Mercator Mercator '91.

**Note:** Information about the Wisconsin Transverse Mercator '91 projection is available at the Enterprise Data Management and GIS Analysis and Mapping Services sections' website found on the internet at [www.dnr.state.wi.us/org/at/et/gee](http://www.dnr.state.wi.us/org/at/et/gee) <http://dnr.wi.gov/maps/gis/wtm8391.html>.

3. 'Acceptable methods.' Acceptable methods for obtaining geographic position data include direct location or interpolation from other features on a base map of 1:24000 scale or finer, differentially corrected global positioning system data, or other methods capable of similar or superior accuracy that have been approved by the department.
4. 'Required information.' The following information is required for all properties: the name of the county where the property is located, the collection method used, and the scale or resolution of original source of geographic position for on-screen digitizing.

~~(l) (6) Conclusions and recommendations~~ CONCLUSIONS AND RECOMMENDATIONS. The site investigation report shall include a A summary of the results from the site investigation, and recommendations for further response actions necessary to protect public health, safety and welfare and the environment, and to meet the requirements of chs. NR 700 to 726.

**NR 716.17 Additional requirements. (1)** When warranted by the complexity of the site or facility or the severity of the actual or potential environmental or public health impacts which may be caused by the contamination, the department may impose additional site investigation requirements upon responsible parties beyond those specifically described in this chapter. The department shall communicate any additional investigation requirements to the responsible parties in writing and shall explain why the additional requirements are needed.

**(2)** The department may require that treatability studies be conducted as part of the site investigation, where appropriate for the purpose of demonstrating that an interim action or remedial option will meet the remedy selection criteria in ch. NR 708 or 722.

**(3)** When a site investigation conducted under this chapter indicates that an immediate, interim or remedial action is necessary, the responsible parties shall identify, evaluate and select an immediate or interim action in accordance with ch. NR 708 or a remedial action in accordance with ch. NR 722.

**(4)** When a site investigation conducted under this chapter indicates that, based on the criteria in s. NR ~~726.05~~ (4) 726.05, no further action is necessary to protect public health, safety or welfare or the environment, the responsible parties may request that the department close the case in accordance with ch. NR 726.