O&M GROUNDWATER INSPECTION FORM FOR LONG TERM CARE SITES

Revision:
WASTE & MATERIALS MANAGEMENT PROGRAM

Section 1: Pre-Inspection File Review

A. Indicate the type of facility being inspected. 1. Surface impoundment 2. Landfill 3. Waste Pile 4. Other		
B. Indicate the date of the Sampling and Analysis Plan and the date of the department's approval letter.		
C. Indicate the date of the Groundwater Monitoring Plan and the date of the department's approval letter.		
D. Indicate the date of the Long Term Care Plan and the date of the department's approval.		
E. Identify plan modification approvals which affect the implementation of the groundwater monitoring program.		
F. Indicate the date the Long Term Care License was issued and the expiration date.		
G. The facility is currently operating a: 1. Detection monitoring program. 2. Compliance monitoring program. 3. Groundwater investigation program.		
H. The groundwater flow rate and direction in all aquifers is determined according to the approved Long Term Care Plan or Groundwater Monitoring Plan.		
I. Groundwater samples are collected at the required frequency.		
J. Groundwater data is submitted to the department electronically for entry into GEMS.		
K. The groundwater monitoring report is submitted by the dates specified in the plan approval.		
L. The number, type and locations of the monitoring wells are in agreement with GEMS, the groundwater monitoring plan, plan approval and/or long term care license.		
M. Groundwater quality is tabulated in the monitoring report at each monitoring well to determine statistically significant increases.		
N. The groundwater monitoring report includes an evaluation of any changes necessary to protect human health (migrating plume, increasing groundwater concentrations) and suggested responses.		
O. The groundwater monitoring report evaluates the potential for a reduction in the long term care period due to decreasing groundwater concentrations.		
P. Known sources outside of the waste management area or the facility boundaries that could cause fluctuations in the water table, other than natural fluctuations, have been identified.		
Q. Evidence has been provided which demonstrates that either natural or man made fluctuations of the water table or other potentiometric surfaces influence the direction of groundwater flow in a horizontal or vertical direction.		

Section 2: Inspection of Monitoring Wells

A. Each monitoring well was physically evaluated during the inspection. List in the comments section all monitoring wells that were not physically inspected and why an inspection was not or could not be performed. List in the comments section any deficiencies that were observed.			
B. All monitoring wells are properly and permanently marked.			
C. All monitoring wells are properly maintained.			
D. All monitoring wells are protected and secure.			

Section 3: Groundwater Sample Collection Procedures

A. Sample collection procedures were evaluated from at least three different groundwater monitoring well locations. Indicate in the comments section the monitoring well locations where sample collection procedures were observed.			
B. Indicate in the comments section the name, position or title, and years of sampling experience for each member of the sampling team.			
C. Observe at least one sampling event that includes an equipment blank and field blank. Indicate in the comments section the monitoring well locations where the collection of blanks was observed.			
D. Samples are collected from the least contaminated to the most contaminated monitoring well.			
E. The depth to standing water and the depth to the bottom of the monitoring well are measured to +/- 0.01 feet.			
F. Indicate in the comments section the type of water level measuring device used.			
G. A reference measuring point is established on the inner casing material.			
H. Measuring equipment is properly cleaned between each monitoring well to prevent cross contamination.			
I. Describe in the comments section the procedures used to detect light phase immiscible layers.			
J. Procedures are used to minimize mixing with water soluble phases.			
K. Low yielding monitoring wells are evacuated to dryness prior to sampling.			
L. High yielding monitoring wells are evacuated by removing at least three well volumes. Note in the comments section if additional well volumes are removed or if low-flow purging is used.			
M. Indicate in the comments section the type of device used to evacuate the monitoring wells.			

Section 3: Groundwater Sample Collection Procedures

N. Purge water is collected for storage and analysis. Describe in the comments section how the purge waste is managed.		

Section 4: Sample Withdrawal Procedures

A. For low yielding monitoring wells, samples for volatiles, pH, and oxidation/reduction potential are drawn first after the well recovers.		
B. Indicate in the comments section the type of sample extraction device used to obtain well samples.		
C. If bailers are used, fluorocarbon/resin (Teflon) coated wire, single stand stainless steel wire or monofilament is used to raise and lower the bailer.		
D. If bailers are used, the contents are transferred to the sample container in a way that minimizes agitation and aeration (for example, use a bottom emptying device to decant the sample).		
E. If bailers are used, they are lowered slowly to prevent degassing of the water.		
F. If bladder pumps are used, they are operated in a continuous manner to prevent aeration of the sample.		
G. Clean sampling equipment, hoses and lines are not placed on the ground or other contaminated surfaces prior to insertion into the monitoring well.		
H. If non-dedicated sampling equipment is used, the equipment is disassembled and thoroughly cleaned between samples.		
I. If non-dedicated sampling equipment is used for inorganic analysis, the cleaning procedure includes a dilute acid rinse (nitric or hydrochloric acid) and distilled/deionized water rinse.		
J. If non-dedicated sampling equipment is used for organic analysis, the cleaning procedure includes the following sequential steps: 1. Nonphosphate detergent wash. 2. Tap water rinse. 3. Distilled/deionized water rinse. 4. Acetone rinse. 5. Pesticide-grade hexane rinse.		
K. Sampling equipment is thoroughly dry before use.		
L. Equipment blanks are taken to ensure that sample cross-contamination has not occurred.		
M. Equipment blanks are obtained on a daily or per trip basis, at a minimum.		
N. If volatile samples are taken with a positive gas displacement bladder pump or other type of down hole pumping device, pumping rates are kept below 100 ml/min.		

Section 4: Sample Withdrawal Procedures

O. Sampling equipment maintenance schedules are followed.		
P. Appropriate criteria are followed when deciding to replace or repair sampling equipment and monitoring wells.		
Q. An adequate inventory of sampling equipment and sampling devices are available for the monitoring program.		

Section 5: Field Analyses

A. The following parameters are evaluated in the field: 1. pH. 2. Temperature. 3. Specific conductance. 4. Redox potential. 5. Chloride. 6. Dissolved oxygen. 7. Turbidity. 8. Color. 9. Odor. 10. Other - indicate in the comments section.		
B. Field analyses are made after well evacuation and sample removal.		
C. Each field parameter is measured from a split portion.		
D. Monitoring equipment is calibrated according to manufacturer's specifications and consistent with SW-846.		

Section 6: Sample Containers

A. Samples are transferred directly from the sampling device to the sample container.		
B. Sample containers for metals analysis are polyethylene with polypropylene caps.		
C. Sample containers for metals analysis are cleaned using the following sequential steps: 1. Nonphosphate detergent wash. 2. 1:1 nitric acid rinse. 3. Tap water rinse. 4. 1:1 hydrochloric acid rinse. 5. Tap water rinse. 6. Distilled/deionized water rinse.		
D. Sample containers for organic analysis are glass bottles with fluorocarbon resin-lined caps.		

Section 6: Sample Containers

E. Sample containers for organic analysis are cleaned using the following sequential steps: 1. Nonphosphate detergent/hot water rinse. 2. Tap water rinse. 3. Distilled/deionzied water rinse. 4. Acetone rinse. 5. Pesticide-grade hexane rinse.		
F. Trip blanks are used for each shipping container of samples.		

Section 7: Sample Preservation Procedures

A. Samples for the following analyses are cooled to 4 degrees C. 1. TOC 2. TOX 3. Chloride 4. Sulfate 5. Nitrate 6. Coliform Bacterial 7. Cyanide 8. Oil and Grease 9. Hazardous constituents in NR 664 Appendix IX		
B. Samples for the following analyses are field acidified to a pH < 2 with nitric acid. 1. Iron 2. Manganese 3. Sodium 4. Total metals 5. Dissolved metals 6. Fluoride 7. Endrin 8. Lindane 9. Methoxychlor 10. Toxaphene 11. 2,4-D 12. 2,4,5-TP Silvex 13. Radium 14. Gross Alpha 15. Gross Beta		
C. Samples for the following analyses are field acidified to a pH <2 with sulfuric acid: 1. Phenols 2. Oil and Grease		
D. Samples for TOC analysis are field acidified to a pH <2 with hydrochloric acid.		
E. Samples for TOX analysis are preserved with 1 ml of 1.1 M sodium sulfite.		
F. Samples for cyanide analysis are preserved with sodium hydroxide to pH >12.		

Section 8: Special Handling Considerations

A. Organic samples are not filtered.			
B. Volatile organic sample vials do not contain headspace.			
C. Samples for metals analysis are split into two portions: 1. The sample portion for dissolved metals is filtered through a 0.45 micron filter. 2. The sample portion for total metals is not filtered.			
D. Ice packs (or equivalent) used to chill samples will not affect the samples in any way, such as loosening the sample container labels.			
E. Samples are analyzed by a State of Wisconsin certified lab (NR 149).			

Section 9: Chain of Custody

A. The sample labels contain the following information: 1. Sample identification number. 2. Name of collector. 3. Date and time of collection. 4. Place of collection. 5. Parameters requested and preservatives used.			
B. Labels remain legible even when wet.			
C. Seals are placed on shipping containers to ensure samples are not altered according to written instructions. Describe in the comments section the method of sealing containers.			
D. Chain of custody record is prepared for each sample.			
E. Chain of custody record includes all of the following: 1. Sample number. 2. Signature of collector. 3. Date and time of collection. 4. Sample type. 5. Well location. 6. Number and type of containers per sample. 7. Parameters requested. 8. Preservative used, filtered/non filtered metals. 9. Signatures of persons involved in chain of custody. 10. Date and signature block for persons receiving samples. 11. Duplicates, field blanks, equipment blanks, trip blanks.			

Section 10: Field Documentation

A. The following information is recorded for each sampling event in a field logbook or otherwise documented: 1. A map or written description of the location of each monitoring well. 2. The type of monitoring well sampled. 3. Well evacuation procedures. 4. Date and time of sample collection. 5. Well sampling sequence. 6. Types of sample containers and sample identification numbers. 7. Preservatives used. 8. Parameters requested. 9. Field analysis data. 10. Sample distribution and transport. 11. Unusual well recharge rates. 12. Equipment malfunctions or other problems encountered during sampling. 13. The date, procedure, and maintenance performed on equipment.		
B. The following information is available to the field technician: 1. The original measured depth of each monitoring well. 2. The required frequency of measuring the total depth of the monitoring well. 3. Static water level measurement techniques. 4. Procedures to follow if immiscible layers are detected, including specific methods for sampling. 5. Types of sample containers to be used. 6. Field analysis methods.		

Section 11: Quality Assurance/Quality Control

A. Sampling and analysis is done according to the procedures stated in the approved QA/QC plan.		
B. QA/QC samples are used to correct the data.		
C. Approved statistical methods are used to determine if any statistically significant increases are occurring.		

Section 12: Operating Record

A. The following documents are maintained in the operating record: 1. Annual reports of groundwater monitoring results. 2. Inventory of all sampling devices and purging equipment used at the facility, including the model number, serial number and manufacturers name. 3. Detailed operating, calibration and maintenance procedures for each sampling device. 4. Criteria used to decide when to replace or repair sampling equipment and/or monitoring wells. 5. Schedules for performing operation and maintenance activities on the groundwater monitoring system. 6. Groundwater monitoring records including all of the following: i. Exact place, date, and time of sampling or measurements. ii. Individuals who performed the sampling or measurements. iii. Date the analysis was performed. iv. Analytical techniques or methods used. v. Results of each analysis. 7. A determination of groundwater flow rate and direction in the uppermost aquifer on an annual basis, such as a potentiometric map prepared annually using data collected during the year.		

Section 13: Evaluation Summary

A. The facility is in compliance with the approved Sampling and Analysis Plan, Groundwater Monitoring Plan, Long Term Care Plan and all conditions of approval, including modifications.		