

Groundwater Protection Plan for Monitoring Well Owners

Introduction

Administrative regulation 401 KAR 5:037 established the requirement to prepare and to implement groundwater protection plans for activities that have the potential to pollute groundwater. The purpose of a groundwater protection plan is to ensure protection for all current and future uses of groundwater and to prevent groundwater pollution.

401 KAR 5:037 specifically requires the Natural Resources and Environmental Protection Cabinet to prepare a generic groundwater protection plan for construction, operation, closure and capping of water wells. Any monitoring well owner who does not prepare his own groundwater protection plan should implement the provisions of this generic plan.

The requirements of this generic groundwater protection plan do not supersede or in any way exempt any water well from other federal or state regulatory requirements to which it may be subject.

Monitoring wells must be constructed, modified, or abandoned by a certified monitoring well driller in accordance with KRS 223.400 through 223.460. Monitoring well construction practices and standards are provided in 401 KAR 6:310.

1. Identification of Activities Covered by this Groundwater Protection Plan

This generic groundwater protection plan pertains to monitoring well-related activities that have the potential to pollute groundwater.

1. Proper Well Construction and Installation

The need for a monitoring well or monitoring well network indicates that groundwater contamination is a legitimate concern at your facility. Monitoring wells are used to document existing contamination, detect suspected contamination, or to provide early leak detection (*e.g.*, those facilities with an established point of compliance). The first pathway for potential groundwater pollution associated with monitoring wells occurs during the installation and construction phase. The two (2) main areas of concern are:

1. subsurface cross-contamination of different aquifers and
2. surface runoff or contaminants infiltrating into the subsurface

The individual responsible for implementing this Groundwater Protection Plan must work with those persons responsible for the design of the monitoring plan at the site (*i.e.*, geologist, consulting engineer, etc.) and the certified well driller in order to ensure that the following requirements are met:

1. the well is appropriately sited.
2. the well is installed and constructed in a manner protective of groundwater (refer to requirements in certified drillers= GPP).
3. the well design is suitable for its intended use.

2. Well Maintenance and Rehabilitation

Monitoring well maintenance is required to provide representative levels and samples of the groundwater and to extend the life of the well. Maintenance includes proper documentation of factors to be used as benchmarks for data comparison throughout the monitoring program. A well maintenance program should be established upon construction of the well(s).

A monitoring well network should be evaluated periodically to verify that all wells are functioning properly. A checklist is provided in the "Groundwater Protection Practices" section of this document to help you recognize potential problems.

The maintenance requirements of a well are influenced by the design of the well and the characteristics of the water-bearing zone. Problems are typically caused by poor well design,

improper installation, incomplete development, borehole instability, and chemical, physical, and/or biological degradation.

Some maintenance/rehabilitation techniques used to restore well yields include chemical and mechanical methods. However, chemical treatment should be considered only when mechanical methods have been unsuccessful. Chemical treatment can introduce foreign substances into the aquifer and may affect water quality analysis. Extensive purging of the well is necessary after chemical treatment to avoid this problem. The use of chemicals in well maintenance activities should be documented and kept on file with other well history information.

Mechanical rehabilitation methods most suitable for monitoring wells include: 1) bailing, 2) surging, 3) pumping/overpumping/backwashing, and 4) combinations of these methods. These are the same techniques used during well development. These methods pose no significant pollution potential and will not impair your water quality analysis.

Exterior well maintenance is also necessary. To avoid problems with surface runoff or contaminants infiltrating into the well and unauthorized access or entry into the well, exterior maintenance checks are necessary. Simple visual inspection can detect such problems as: 1) cracked or corroded well casing; 2) broken or missing well cap or lock; 3) damage to protective casing; and 4) settling and cracking of surface seals.

3. Accurate Record Keeping

The well owner is advised to keep detailed records of all well maintenance/rehabilitation practices that are performed. Documentation of the activities conducted regarding your monitoring well help prevent problems from development and aid in determining the causes and/or solutions to future problems that may develop. It is essential to document the groundwater protection practices you select, an implementation schedule, and an inspection schedule required as part of your groundwater protection plan. Accurate record keeping verifies that your Groundwater Protection Plan has been properly implemented.

4. Well Abandonment Responsibilities

The well owner has the responsibility to ensure a certified monitoring well driller is contracted to properly abandon a well that is no longer suitable for its intended use. A properly abandoned well should have the well casing removed by pulling or overdrilling. The resulting hole should be filled with cement/bentonite (90/10 ratio) or bentonite by tremie pipe from the bottom to the top of the well. When casing cannot be removed (*i.e.*, metal casing), an alternate method may be permissible with prior approval from other federal or state regulatory programs.

2. Groundwater Protection Practices

The monitoring well owner must select and implement groundwater protection practices which address those pathways for potential groundwater pollution associated with the monitoring well. Indicate the protective practices you intend to utilize by completing Section IV and V of this Generic Groundwater Protection Plan. The following are examples of protective practices:

1. Avoid locating potential sources of contamination in the vicinity of the well, such as: chemical storage areas, machinery maintenance areas, waste piles, above ground storage tanks, etc.
2. Avoid the use and/or storage of potential pollutants near the well, such as: pesticides, herbicides, fertilizer, degreasers, fuel, etc.
3. Contour the area around the well so that surface runoff drains away from the well.
4. Provide a locking cap to prevent unauthorized entry into the well.
5. In high traffic areas, protect the well from equipment damage by surrounding the well with highly visible bumper guards.
6. DO NOT use dry wells, piezometers, or wells that have not been properly abandoned for disposal purposes. Have these wells properly abandoned by a certified driller.
7. Assign an on-site representative to work with the well driller to ensure that your monitoring well is adequately installed, constructed, and developed. The representative should review the driller's Groundwater Protection Plan and note the driller adherence to the plan. Document any deviations from the plan. Work with the driller to correct problems prior to initiating the monitoring program. For example, adequate well seals and surface seals are essential to prevent subsurface

cross-contamination of aquifers, and to prevent surface runoff and contaminants from entering the well.

8. Verify that you have an appropriate well design. The on-site representative should correlate the hydrogeologic information obtained during the review of published literature and site reconnaissance with the site-specific information recorded on the driller's log (*e.g.*, aquifer thickness, lithologies, confining beds, etc.). This verification step is especially important in determining proper well screen placement.
9. Know how the suspected contaminant moves in the subsurface environment. For example, sites where Dense Non-Aqueous Phase Liquids (DNAPLs) are a problem will require specific controls on well installation and construction to avoid polluting a lower aquifer. Refer to technical guidance documents, confer with specialists in that particular area, etc., for these particularly troublesome sites. Document the references and resources you utilized to address these situations.
10. Select mechanical well rehabilitation methods in favor of chemical methods, unless chemical treatment is absolutely necessary. If chemical treatment is selected, then document the specific substance used, how much was used; how the procedure was conducted, when the treatment occurred, and who was in charge of the procedure. Immediately following chemical rehabilitation, adequately purge the well to remove any residual amount of the substance from the aquifer media adjacent to the well screen.
11. Purge water may require containment, special treatment and/or a permit prior to disposal. Documentation of this disposal process should be kept with other well information and the groundwater protection plan paper work.
12. Perform exterior well maintenance inspections.
13. Initiate a well maintenance program. Use the following checklist to detect problems:
 1. Record the depth of the well every time a water sample is collected or a water level reading is taken. This depth information should be reviewed at least annually to determine if the well is filling with sediment.
 2. If turbid water samples are collected, then redevelopment of the well may be necessary.
 3. Hydraulic conductivity tests are recommended every five (5) years or when significant sediment has accumulated in the well.
 4. Slug or pump tests are recommended every five (5) years. Redevelopment of the well is required if the tests indicate well performance is deteriorating.
 5. Plot and review potentiometric surface maps annually.
 6. High and low water level data should be examined at least every two (2) years to assure that well locations and screening intervals remain acceptable.

Complete the following sections to execute this generic groundwater protection plan.

3. General Information

NAME: _____
(Well Owner)

ADDRESS: _____

COUNTY: _____

PHONE #: _____

Name of person responsible for implementing this Groundwater Protection Plan:

4. Schedule of Implementation of Groundwater Protection Practices

Selected Practices	Schedule (weekly, monthly, etc)

(Attach additional pages if needed)

5. Schedule of Regular Inspections Confirming Groundwater Protection Practices are in Place and Functioning.

Selected Practices	Inspection Schedule

*Keep all inspection records on file with your groundwater protection plan.

6. Incorporation of Requirements of Other Regulatory Programs

Name of Regulatory Program _____

Does this program have specific requirements for monitoring well construction and installation?

Yes _____ No _____ If yes, provide an explanation of these requirements.

(Attach additional pages if needed.)

Provide the requested information for the well(s) under this regulatory program.

AKGWA Number	Monitoring Well ID #	Driller's Name and Certification Number	Date Installed

(Attach additional pages if needed.)

Duplicate this section as needed for additional regulatory programs.

Certification of Compliance

I certify that as of this date I am in compliance with the requirements of the regulatory program(s) listed in Section 6-1 of this generic groundwater protection plan.

(Signature of person responsible)

(Date)

7. Certification of Groundwater Protection Plan

To the best of my knowledge, the groundwater protection practices I have selected and will implement according to the schedule given herein are adequate to protect groundwater from pollution associated with the use of this well(s).

(Signature of well owner)

(Date)