

PRELIMINARY EVALUATION REPORT

Standard Report Format for New Wells and Springs
January 2007 (based on Rules of April 2005)

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STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF DRINKING WATER

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PRELIMINARY EVALUATION REPORTS

R309-600 of the Utah Administrative Code

If the Standard Reporting Format identified in this document is used, the Division of Drinking Water should be able to provide a timely review and response. If it is not followed, the writer must ensure that each item is adequately addressed. To ensure that the report is complete, please number each section of the Preliminary Evaluation Report to match the sections of the Standard Report Format.

A Preliminary Evaluation Report (PER) is required for all new wells, springs, and tunnels, which are used as sources of drinking water by a PWS. The PER and the Engineering Plans and Specifications should be submitted concurrently allowing for concurrent review. All geologic work submitted to the Division of Drinking Water (DDW) must be stamped and signed by a licensed geologist or licensed engineer. DDW will not issue an operating permit to use the source until both plans are reviewed and approved.

A PER cannot be approved if there are:

- Uncontrolled potential contamination sources or pollution sources within zone one of wells in protected aquifers
- Uncontrolled potential contamination or pollution sources within zone one and uncontrolled pollution sources within zone two of wells and springs in unprotected aquifers
- No land use agreement or zoning ordinance to restrict the future location of uncontrolled potential contamination or pollution sources within zone one of wells in protected aquifers
- No land use agreements or zoning ordinances to restrict the future location of uncontrolled potential contamination or pollutions sources within zone one and uncontrolled pollution sources within zone two of wells and springs in unprotected aquifers

Replacement Wells

A PER is not required for proposed replacement wells. However, PWSs must submit a letter requesting that a well be classified as a replacement well and include documentation to show that the conditions required in R309-600-6(1)(y) are met. If a proposed well is classified as a replacement well, the PWS is still required to submit and obtain written approval for all other information as required in: (a) DWSP Plan for New Sources of Drinking Water (refer to R309-600-13(6), and (b) the Outline of Well Approval Process (refer to R309-515-6(5)).

Note: A Preliminary Evaluation Report must be submitted and approved before a well is drilled and before the Drinking Water Source Protection Plan is developed. Drinking Water Source Protection Plans are required within one year after the Preliminary Evaluation Report is approved. Please refer to the *Standard Report Format for Existing Wells and Springs* for specific instructions to develop a Drinking Water Source Protection Plan.

EXECUTIVE SUMMARY

Include a brief summary of this report.

1.0 INTRODUCTION

1.1 System Information:

Include the water system name, number, and address. Is it a new or an existing water system? Is it a public or a non-public water system? If public, is it a community, a non-transient/non-community, or a transient/non-community water system? The first name of a new water system submitted to DDW will be the name under which it will be tracked in the future. Please ensure, to the best of your ability, that the name established for the water system remains the same. A water system number will be assigned to that name.

1.2 Source Information:

Include the source name. Is it a proposed new source? Is it a well, spring, or tunnel? Is it an individual source, a well field, or a spring field? Is this source already constructed? Include a brief description of the source location. Have the plans and specifications been submitted to DDW/Engineering Section?

1.3 Designated Person - R309-600-5:

Include the name, address, and phone number of the designated person. This information must be included in each PER that is submitted to DDW. Correspondence regarding this report and future correspondence will be directed to the designated person.

2.0 DELINEATION REPORT - R309-600-9(5)

Include the following information and a list of all sources or references for the information:

2.1 Geologic Data - R309-600-9(5)(a)(i):

Include a brief description of geologic features and aquifer characteristics observed in the well and area of the potential protection zones. This should include the formal or informal stratigraphic name(s), lithology of the aquifer(s) and confining unit(s), and description of fractures and solution cavities (size, abundance, spacing, orientation) and faults (brief description of location in or near the well, and orientation). Lithologic descriptions can be obtained from surface hand samples or

well cuttings; core samples and laboratory analyses are not necessary. Fractures, solution cavities, and faults may be described from surface outcrops or drill logs.

2.2 Well or Spring Construction Data - R309-600-9(5)(a)(ii) & (iii):

If the source is a well, include the following information: Well driller's log of the well or logs of wells in the area that are representative of the planned well, if they are available, anticipated elevation of the well head, planned borehole and casing radius, projected total depth of the well and depth and length of the screened or perforated interval(s), well screen or perforation type to be used, method of well construction, type of pump to be used, expected location of the pump within the well, and the maximum projected pumping rate of the well. Averaged pumping rate values shall not be used. If the well has already been constructed please provide all the specific data required by the rules as if the well were an existing source.

If the source is a spring or tunnel, include the following information: A description or diagram of the collection area and method of ground-water collection.

2.3 Aquifer Data - R309-600-9(5)(a)(iv):

The following information must be included in the report.

a. The aquifer properties that are needed to determine protection areas include:

Hydraulic conductivity, transmissivity, hydraulic gradient, direction of ground-water flow, estimated effective porosity, and saturated thickness of the producing aquifer(s). Estimated effective porosity must be between 1% and 30%. Clay layers shall not be included in calculations of aquifer thickness or estimated effective porosity.

b. The best way of determining aquifer properties is from a constant-rate aquifer test described in R309-515-6(10)(b). However, this is not normally available for new wells. Therefore, if this test information is not available from the new well or a nearby well, in the same aquifer, then the aquifer properties will have to be estimated. Estimates can be derived using specific capacity information for nearby wells (found in well logs) or from published information. There are many sources of published information on aquifers throughout the State. The U.S. Geological Survey, whose reports are published by the Utah Department of Natural Resources, as well as the U.S. Geological Survey, has studied most areas. The method of determining the aquifer properties should be described. If the properties are estimated the method and underlying logic for determining the estimates must be described. All sources of information used in determining aquifer properties should be properly cited.

2.4 Hydrogeologic Methods and Calculations - R309-600-9(5)(a)(vii):

Include the hydrogeologic method used to delineate the protection zones, all applicable equations, values, and the calculations which determine the delineated boundaries of zones two, three, and four. If a computer model was used, include a description of the model and the parameters input into the model, as well as any assumptions behind the model or input values. Include any printouts of the data or graphical presentations from the computer program. Raw data and other output from the computer program may be included in an appendix. The hydrogeologic method or ground-water model must be reasonably applicable for the aquifer setting. For wells, the hydrogeologic method or ground water model must include the effects of draw down (increased hydraulic gradient near the well) and interference from other wells.

2.5 Map Showing Boundaries of the DWSP Zones - R309-600-9(5)(a)(viii):

- a. A map showing the location of the ground-water source of drinking water and the boundary for each DWSP zone. The base map shall be a 1:24,000-scale (7.5-minute series) topographic map, such as is published by the U.S. Geological Survey. Although zone one (100-foot radius around the well or margin of the collection area) need not be on the map, the complete boundaries for zones two, three, and four must be drawn and labeled. More detailed maps are optional and may be submitted in addition to the map required above.
- b. Include a written description of the distances that define the delineated boundaries of zones two, three, and four. These written descriptions must include the maximum distances up gradient from the well, the maximum distances down gradient from the well, and the maximum widths of each protection zone.

2.6 Protected or Unprotected Aquifer Classification - R309-600-9(3) & (6):

If the source is a well, indicate whether it meets the following criteria: 1) A naturally protective layer of clay, at least 30 feet in thickness, is present above the aquifer; 2) data to indicate the lateral continuity of the clay layer extends throughout zone two; and 3) the well is constructed with a grout seal that extends from the ground surface down to at least 100 feet below the surface, and through the protective clay layer (R309-600-9(6)). If these criteria are met, the aquifer may be considered protected.

If the PWS is seeking protected aquifer status for the well, and the well meets the criteria explained above, the licensed geologist or licensed engineer must state that the aquifer meets the definition of a protected aquifer based on the following

information which must be included in the report: 1) Thickness, depth, and lithology of the protective clay layer; 2) data to indicate the lateral continuity of the protective clay layer over the extent of zone two. This may include such data as correlation of beds in multiple wells, published hydrogeologic studies, stratigraphic studies, potentiometric surface studies, and so forth; and 3) evidence that the well has been grouted or otherwise sealed from the ground surface to a depth of at least 100 feet and for a thickness of at least 30 feet through the protective clay layer in accordance with R309-515-9(6). Include construction methods. If sufficient information is presented to indicate the ground water will be protected from contaminant sources at the surface, the aquifer may still receive a *protected* designation, even though, the above criteria are not met.

Susceptibility waivers are another important reason for determining whether a source is located in a protected aquifer. Protected aquifer status is the most important criterion that is considered when PWSs applications for a source's susceptibility waivers for the pesticide and VOC parameter groups are reviewed. *If this section is not addressed or the case for protected aquifer status is not properly justified then the aquifer will be classified as unprotected.*

3.0 INVENTORY OF POTENTIAL CONTAMINATION SOURCES - R309-600-10

The following information about potential contamination sources (PCSs) may be organized in any manner that formats the data into an arrangement that is easy to understand and reference (information sheets, tables, etc). Ensure that each section (3.1 through 3.5) is addressed.

3.1 List Potential Contamination Sources - R309-600-10(1):

Use the list in Chapter 5 of the Ground Water Source Protection User's Guide and any other appropriate guidance to compile a list of PCSs that are within the four protection zones or the entire management area. The name and address of each commercial and industrial potential contamination source is required. Additional information should include the name and phone number of a contact person. Residential PCSs should be identified individually with addresses or in groups depending on the method the PWS intends to use to contact them for educational purposes.

3.2 Identify Hazards:

List the chemical, biological, and/or radiological substances used, stored, manufactured, transported, and disposed at each PCS. If there are no hazards

associated with the PCS, it may not, in fact, be a PCS. Refer to Chapter 5 of the Ground Water Source Protection User's Guide for the definition of a *potential contamination source*.

3.3 Prioritize the Inventory - R309-600-10(1)

Arrange the list of PCSs that are located within the four protection zones or the entire management area into a greatest to least risk priority order and state the basis for the order.

3.4 Potential Contamination Source Location - R309-600-10(1)

Include a description which identifies each PCS as to its location in zone one, two, three, four or in a management area.

3.5 Potential Contamination Sources Plotted on Map - R309-600-10(1)

PCSs must be plotted on the map required in Section 2.5a of this document.

Sewers Within DWSP Zones and Management Areas

Sewer lines are to be listed on the inventory of potential contamination sources, if they are located in the protection areas. Sewer lines may not be located within zones one and two or a management area unless the criteria identified below are met. If sewer lines are located or planned to be located within zones one and two or a management area, the PER must demonstrate that they comply with this criteria. Sewer lines that comply with these criteria may be assessed as adequately controlled potential contamination sources.

Zone One - If the conditions specified in below are met, all sewer lines within zone one shall be constructed in accordance with R309-515-6(4) and must be at least 10 feet from the wellhead.

- There is at least 5 feet of suitable soil between the bottom of the sewer lines and the top of the maximum seasonal ground-water table or perched water table. (Suitable soils contain adequate sand/silt/clay to act as an effective effluent filter within its depth for the removal of pathogenic organisms and fill the voids between coarse particles such as gravel, cobbles, and angular rock fragments); and
- there is at least 5 feet of suitable soil between the bottom of the sewer lines and the top of any bedrock formations. Bedrock formations include formations that have such a low permeability that they prevent the downward passage of effluent. Bedrock formations that have open joints or solution channels, which permit such rapid flow that effluent is not renovated, are also considered unacceptable. Additionally, unsuitable soil includes coarse particles such as gravel, cobbles, or angular rock fragments with insufficient soil to fill the

voids between the particles. Solid or fractured bedrock such as shale, sandstone, limestone, basalt, or granite are also unacceptable.

Zones One and Two - If the conditions identified above cannot be met, any sewer lines within zones one and two or a management area shall be constructed in accordance with R309-515-6(4) and must be at least 300 feet from the wellhead or margin of the collection area. Exceptions to this requirement may be considered if there is an adequate sewer line leak detection program.

4.0 IDENTIFICATION AND ASSESSMENT OF CURRENT CONTROLS – R309-600-10(2)

A PER cannot be approved if there are:

- *Uncontrolled potential contamination sources or pollution sources within zone one of wells in protected aquifers*
- *Uncontrolled potential contamination or pollution sources within zone one and uncontrolled pollution sources within zone two of wells and springs in unprotected aquifers*

This section is to assess the hazard controls that are already in place to control a PCS. The assessment steps for each type of control are explained below. There are four types of hazard controls: Regulatory, best management/pollution prevention, physical, and negligible quantity controls. Reassessment dates are not required in the Preliminary Evaluation Report; however, they will be required when the PER is updated to a Drinking Water Source Protection plan.

Any hazard that is not assessed as *adequately controlled* will be considered to be *not adequately controlled*. Additionally, if the hazards at a PCS cannot be identified, the potential contamination source must be assessed as *not adequately controlled*. Many PCS hazards have no controls and must be assessed as *not adequately controlled*. It is usually redundant to identify more than one hazard control; therefore, only one should be identified for each hazard. The instructions for assessing each type of control must be followed exactly or the assessment will be considered to be incomplete. Refer to the Ground Water Source Protection User's Guide for a list of government agencies and the programs they administer to control PCSs. This guide may be obtained from DDW.

Identify and Assess Regulatory Controls - R309-600-10(2)(a):

Regulatory controls are the codes, ordinances, rules, and regulations that are in effect to control a PCS hazard. The following five steps are required to assess a hazard as adequately controlled by a regulatory control: 1) Identify the enforcement agency; 2) quote and/or cite specific references in the regulation, rule, or ordinance which pertain to controlling this hazard; 3) explain how this regulatory control will prevent ground-water contamination; 4) verify that this PCS hazard is actually being

regulated by the enforcement agency; and 5) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change.

Identify and Assess Best Management and Pollution Prevention Practices – R309-600-10(2)(b):

Identify the best management and pollution prevention practices that are currently being used by the PCS to control the hazardous substances at the facility. The following four steps are required to assess a hazard as adequately controlled by best management and pollution prevention practices: 1) List the specific best management and pollution prevention practices which are being used to control this hazard; 2) indicate that PCS management is willing to continue the use of these practices to prevent ground-water contamination; 3) explain how these best management and pollution prevention practices will prevent ground-water contamination; and 4) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change.

Identify and Assess Physical Controls – R309-600-10(2)(c):

Physical controls are man-made structures and impoundments, such as spill protection structures, that are in place to stop a hazard from entering the ground water. The following three steps are required to assess a hazard as adequately controlled by a physical control: 1) Describe the physical control(s) which have been constructed to control this hazard; 2) explain how these controls prevent contamination; and 3) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change.

Identify and Assess Negligible Quantity Controls – R309-600-10(2)(d):

Negligible quantity controls refer to the amount or the relative non-toxicity of a hazardous substance that is used at a PCS facility. It means that quantity or toxicity is so low that the risk of ground-water contamination is negligible and not worth the time and effort to plan land management strategies to control it. The following three steps are required to assess a hazard as adequately controlled by a negligible quantity control: 1) Identify the hazardous substance and the quantity that is being used, disposed, stored, or transported; 2) explain why this amount should be considered a negligible quantity; and 3) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change.

5.0 LAND OWNERSHIP MAP AND LIST - R309-600-13(2)(c):

A land ownership map that includes all land within zones one and two or the entire management area. Additionally, include a list which exclusively identifies the land owners in zones one and two or the management area, the parcel(s) of land which they own, and the zone in which they own land. A land ownership map and list are not required if ordinances are used to protect these areas.

6.0 LAND USE AGREEMENTS, LETTERS OF INTENT, OR ZONING ORDINANCES - R309-600-13(2)(d):

A PER cannot be approved if there is:

- *No land use agreement or zoning ordinance to restrict the future location of uncontrolled potential contamination or pollution sources within zone one of wells in protected aquifers*
- *No land use agreements or zoning ordinances to restrict the future location of uncontrolled potential contamination or pollutions sources within zone one and uncontrolled pollution sources within zone two of wells and springs in unprotected aquifers*

Land use agreements are required in zone one for new wells in protected aquifers. They are also required in zones one and two for wells in unprotected aquifers and for springs. Land use agreements must be in writing wherein an owner agrees not to locate uncontrolled PCSs within zone one. Additionally, an owner must agree not to locate pollution sources in zone two unless design standards are implemented to prevent contaminated discharges. Any restrictions must be binding on all heirs, successors, and assigns and must be recorded with the property description in the local county recorder's office. This provision applies even if the landowner and the PWS is the same person. Copies of this recording must be submitted to DDW (R309-600-13(6)(1)(n)).

Land use agreements on publicly owned lands need not be recorded in the county recorder's office. However, a written statement from the administrator is required. This statement must meet the criteria identified for land use agreement requirements described above.

A **letter of intent** to record a land use agreement, which has been notarized, may be used when initially submitting a PER. This letter must include the language required in a land use agreement and a statement that, the owner(s) will record a land use agreement with the county recorder's office if the source proves to be an acceptable source. A copy of the land use agreement, which has been recorded with the county recorders office, must be submitted to DDW and an approval letter must be issued before the PWS will be permitted to introduce the new source into its system.

Zoning ordinances may be used in place of land use agreements if they contain the same restrictions as land use agreements do. In other words, uncontrolled PCSs must be restricted from zone one for wells in protected and unprotected aquifers. Uncontrolled pollution sources must be restricted from zone two for wells and springs in unprotected aquifers. It is the responsibility of the PWS to cite and quote references and interpret the zoning ordinance to substantiate these restrictions. Please do not send a zoning ordinance and expect DDW to do this research.

WAIVERS – R309-600-16

You must submit verification that certain pesticides and VOCs are not used within zones one, two, and three to be eligible for a Use Waiver for a new well. These pesticides and VOCs are identified in the *Water Quality Maximum Contaminant Levels, Rule R309-103 Summary*. Guidance for obtaining these waivers is included in the *Ground Water Source Protection User's Guide*. You may request copies of these documents from us, if you don't have them. If pesticides and VOCs are used within zones one, two, and three, you may be eligible for a Susceptibility Waiver; however, you can only apply for Susceptibility Waivers in the DWSP plan that is due within one year after the PER is approved.