

Round: 7B
Category: Geology
Time: 3 min

Refer to Figure 1 on the following page to answer the following questions.

1. Two residences, each with their own water well, are marked with the numbers 1 and 2.
Which one of the two wells is in more danger of having their water polluted? (2 pts)

2. What is the main source of the pollutant in the endangered well? (2 pts)

3. (a) Heavy pumping at the endangered well has caused what ground water table feature to develop? (2 pts)

(b) Why can this feature cause further contamination of the well? (2 pts)

4. Why is the other well safe from any type of pollutants? (4 pts)

5. List two (2) point sources of pollutants visible in the figure. (2 pts)

6. List two (2) non-point sources of pollutants visible in the figure. (2 pts)

7. Downstream, the river in the diagram flows into one of the Great Lakes, where severe algal blooms have recently developed. Given what you know of the upstream environment, name two (2) elements which may be responsible, and list the most likely pollution source. (4 pts)

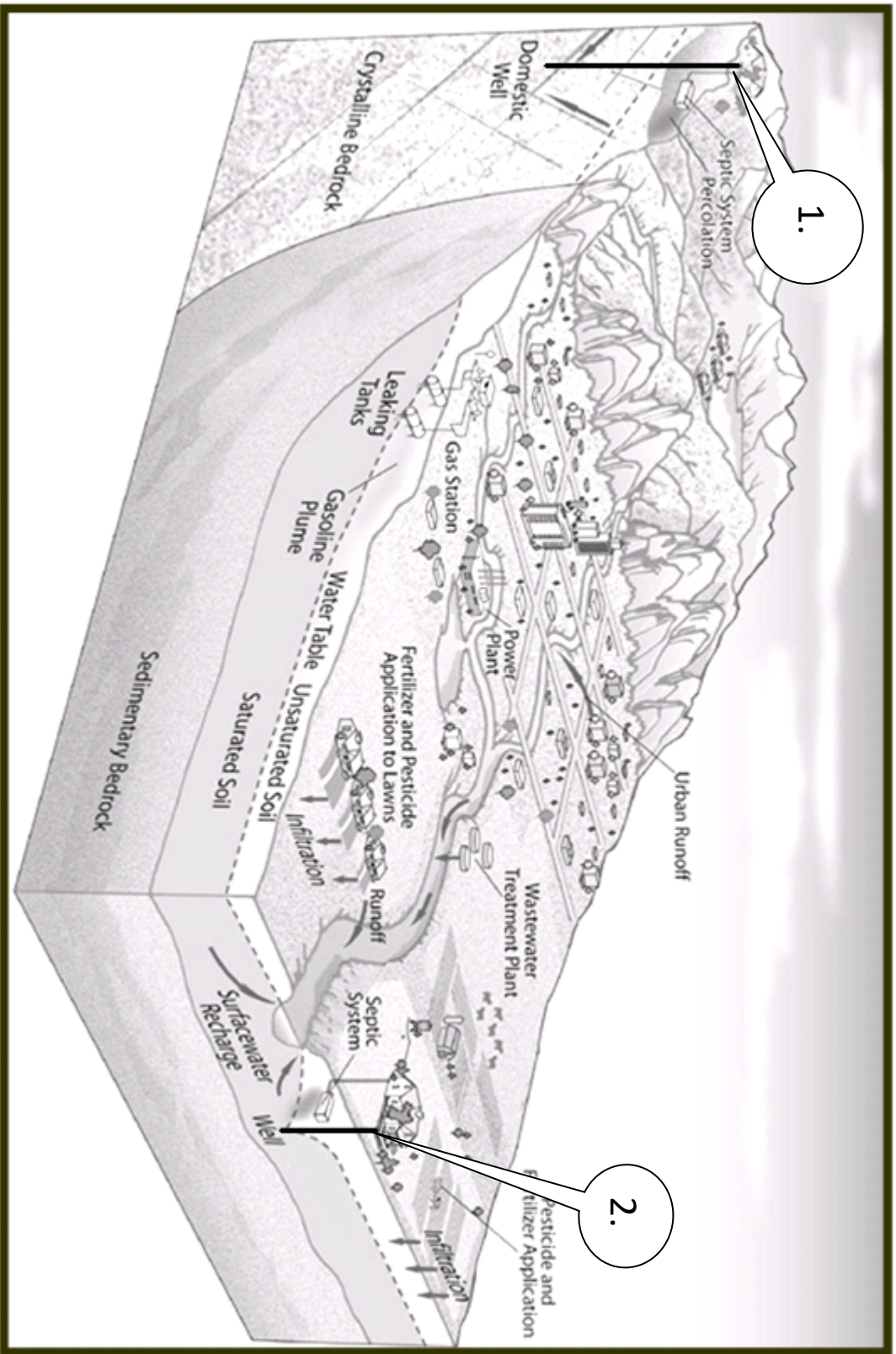


Figure 1: Map of Community Freshwater Supply

ANSWER

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Refer to Figure 1 on the following page to answer the following questions.

1. Two residences, each with their own water well, are marked with the numbers 1 and 2.
Which one of the two wells is in more danger of having their water polluted?
Well 2 is in danger (2 pts)
2. What is the main source of the pollutant in the endangered well?
Septic tank (alternatively, fertilizer or pesticide) (Give them two points if they say septic tank. Give one point if they list a different pollutant) (2 pts)
3. (a) Heavy pumping at the endangered well has caused what ground water table feature to develop?
Ground water drawdown, drawdown OR cone of depression (2 pts)

(b) Why can this feature cause further contamination of the well?
The drawdown/cone of depression causes seepage from the septic system to be drawn into the well (2 pts)
4. Why is the other well safe from any type of pollutants?
Any ONE (1) of the following (4pts total):
 - *Well is drilled into crystalline bedrock*
 - *Well is located in the highlands/high up*
 - *Well is away from any other sources of pollutants*
 - *Well is upstream from the septic tank*
5. List two (2) point sources of pollutants visible in the figure.
Any TWO (2) of the following (1 pt each; 2 points total):
 - *Gas station*
 - *leaking tank*
 - *septic system*
 - *waste water treatment plant*
 - *power plant*
6. List two (2) non-point sources of pollutants visible in the figure.
Any TWO (2) of the following (1 pt each; 2 points total):
 - *Urban runoff*
 - *pesticides*
 - *fertilizers*
 - *farms*

7. Downstream, the river in the diagram flows into one of the Great Lakes, where severe algal blooms have recently developed. Given what you know of the upstream environment, name two (2) elements which may be responsible, and list the most likely pollution source.

Nitrogen (N) (1 pt) AND Phosphorus (P) (1 pt)

Source: fertilizer OR farms/farmland (2 pts)

