Name: _____ Date: _____

Master 1-4

Hazardous Waste

Imagine that you work for a company that advises communities on how to handle waste. A member of Congress has asked your company to make some decisions about a hazardous waste area in the desert. Currently, the waste is stored in a landfill in an isolated area of Nevada, as shown in figure 1-4.1. Very few people live nearby. Recent studies by geologists have shown, however, that the area has a high potential for earthquakes. The waste is liquid and is stored in steel barrels. For a long time, the barrels were the only waste in the landfill, but lately another community has been sending some of its garbage there.

You have the following options:

a. Leave the waste where it is in the landfill. The probability of an earthquake affecting the barrels is 9 percent each year for the next 30 years. After 30 years, the barrels will be slightly more rusted. This means they would be more easily damaged if an earthquake occurred. At that point, the probability that an earthquake would affect the barrels goes up to 15 percent. If a leak occurs, there is no way to stop it.

b. Transport the waste to a Nevada city. The probability of a traffic accident while the trucks are moving the barrels is 8 percent. Once the waste reached the city, it would be burned in an incinerator. The liquid waste would boil away. The remaining waste would be reduced to ash. The ash could then be cemented into concrete blocks. The cement would be used to help protect the environment from the hazardous waste.

The people in the city have organized a protest against this idea. They do not want the waste transported into the city or burned in the city. They also do not want concrete blocks of burned waste to be stored nearby. Transporting the blocks away from the city means that the costs of transportation would be doubled—once to transport the barrels of waste and again for the blocks. This would raise the cost of the disposal method to $60 million. The incinerator would also need a scrubber installed to catch ash. This would increase the costs of the project to $70 million. If this method is adopted and completed without any accidents, there would be no future worry about chemical leaks from the waste.

c. Build an incinerator near the current area. Burn the waste that is in the barrels now and cement the ash into blocks. The workers and materials required to build the incinerator would have to be transported to the isolated area. Because of this, the cost of the project would be $70 million. The incinerator has a probability of increasing air pollution by 16 percent. The ash could reach a small city 200 miles away. Again, the option of a scrubber is available, but this would raise the cost to $80 million. If the project is completed, there would be no future leaks to worry about.

d. Move the waste to another isolated area with a lower risk of earthquakes. The probability of traffic accidents is 8 percent. The cost would be $2 million. This probably would prevent damage to the barrels from an earthquake, but the old barrels would eventually rust. There would be no way to stop leaks when they occur.

e. Place the barrels on the ocean floor. This would cost $6 million. The company would have to transport the barrels through a large city. This raises the probability of a traffic accident to 12 percent. The barrels would corrode and leak more quickly in the ocean than in the desert, but there would be no people living nearby.

Name: _____ Date: _____

BLM / Nevada

Figure 1-4.1: Hazardous waste is sometimes stored in isolated areas. Landfills and other waste disposal can have serious consequences, even when there are not many people in the area. What do you think some consequences might be?