

## SITING YORETOWN'S NEW LANDFILL INFORMATIONAL SHEET

Yoretown has a solid waste disposal problem. The landfill used for the disposal of its solid waste is near maximum capacity. Since Yoretown is so far from other disposal sites, it would not be cost effective to have the community's waste hauled elsewhere, although this remains an option.

The city council has discussed this problem with the Buckeye Solid Waste Management District Policy Committee. The city council and the solid waste district committee have identified four possible landfill sites for a new county landfill. These are on the outskirts of town. The committee now seeks technical advice on which is the best site. Therefore, the district has established a technical advisory council to investigate these potential sites.

Unless otherwise directed by your instructor, your group, representing the technical advisory council, must evaluate the information on each site. After completing the site evaluation sheets, rank the sites. The best site will meet the most criteria and have the least environmental impact. The number one recommendation must be defended with reasons why the site was selected over the others.

### CRITERIA FOR EVALUATION

#### Geology

1. Slope and terrain – These conditions can be important because they determine how much earth must be moved to prepare the site and which direction the surface water will flow off the site.
2. Soil depth – Shallow soils might not provide enough soil for daily cover of the landfill. (Alternative covers, such as foam or canvas blanket, can be used to cover the landfill day by day when soil is difficult to obtain, but at an additional cost)
3. Soil type and permeability – Soil type will influence the permeability at the landfill site. As a rule of thumb, clay soils will have lower permeability than sandy soils (Table 1). The more permeable the soil, the more chance that rainwater can collect in the landfill and become a carrier for leachate (chemicals from the trash). The more impermeable the soil layer at the bottom of the landfill, the less likely leachate can seep through to the groundwater.

Table 1.

Soil Particle Type	Particle size Diameter (mm)	Permeability
Clay	Below 0.002	Very slow
Silt	0.05 - 0.002	Slow
Very Fine Sand	0.10 - 0.05	Moderately Slow
Fine Sand	0.25 - 0.10	Moderate
Medium Sand	0.5 - 0.25	Moderately Rapid
Coarse Sand	1.0 - 0.5	Rapid
Very Coarse Sand	2.0 - 1.0	Very Rapid

4. Bedrock – Exposed bedrock can have pores or fractures that allow the water to flow through. Bedrock of a less porous nature and, without fractures, lessens the chance for liquids to drain out of the landfill.

### **Groundwater**

Depth of uppermost aquifer system – Many farms and cities rely on groundwater for drinking water. Sites close to an existing water well or well field should be carefully evaluated. There should be at least 15 feet between the bottom of the landfill (landfill liner) and the uppermost aquifer.

### **Gas Migration**

Potential explosive gas migration – Over a period of time as waste decomposes, explosive gases such as methane can develop. Potential pathways for this gas to migrate beyond the landfill include underground utility structures such as sewers, water lines or electric cables, pipelines, oil wells, and gas wells. These should not be within 1000 feet of the landfill.

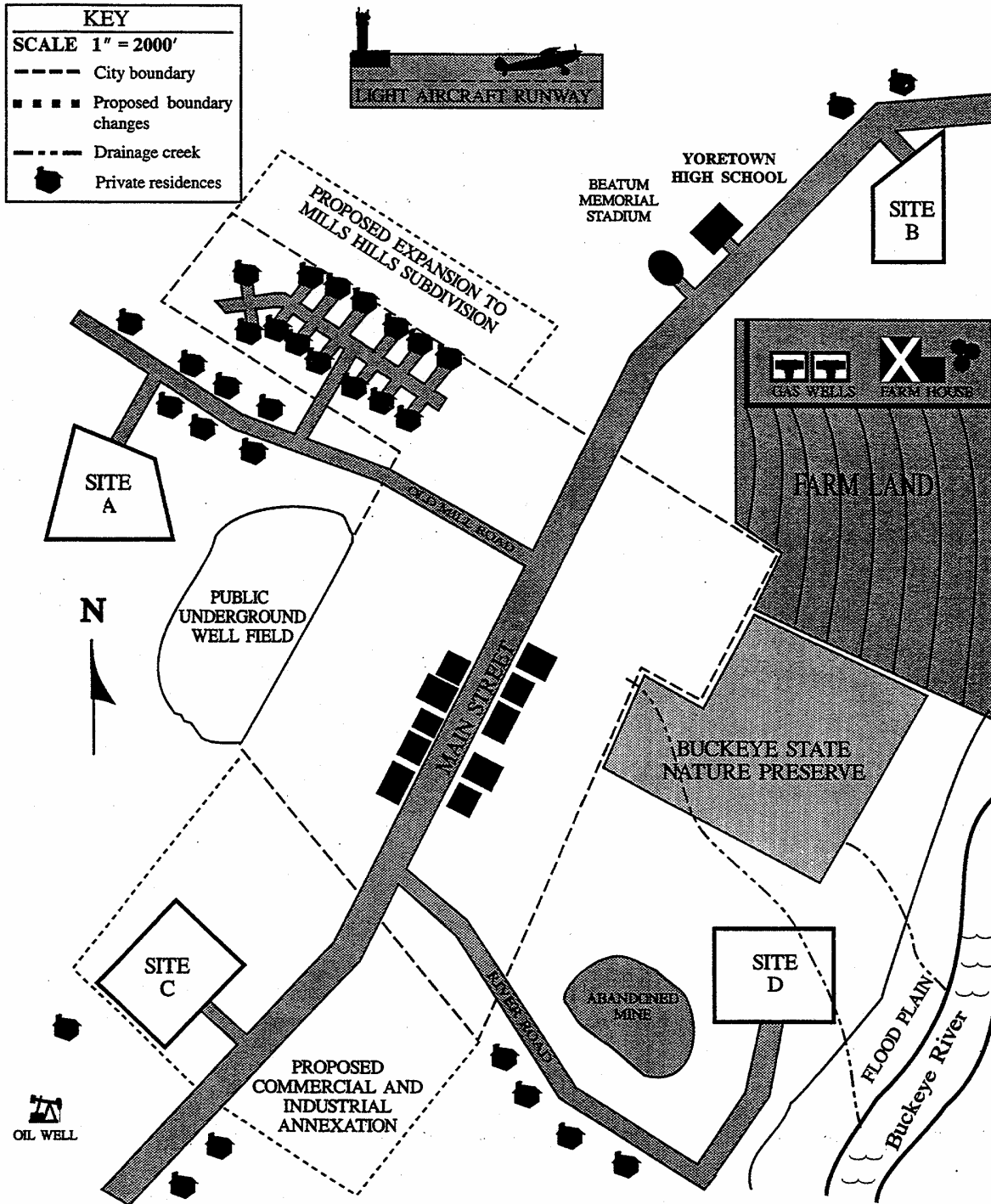
### **Wells, Mines, and Quarries**

Wells, mines, and quarries can be sources of potential subsidence, especially if within 2,000 feet of the buried solid waste. Subsidence can cause rupturing of the liner systems which are designed to contain hazardous liquids that collect at the bottom of landfills.

### **Other Issues**

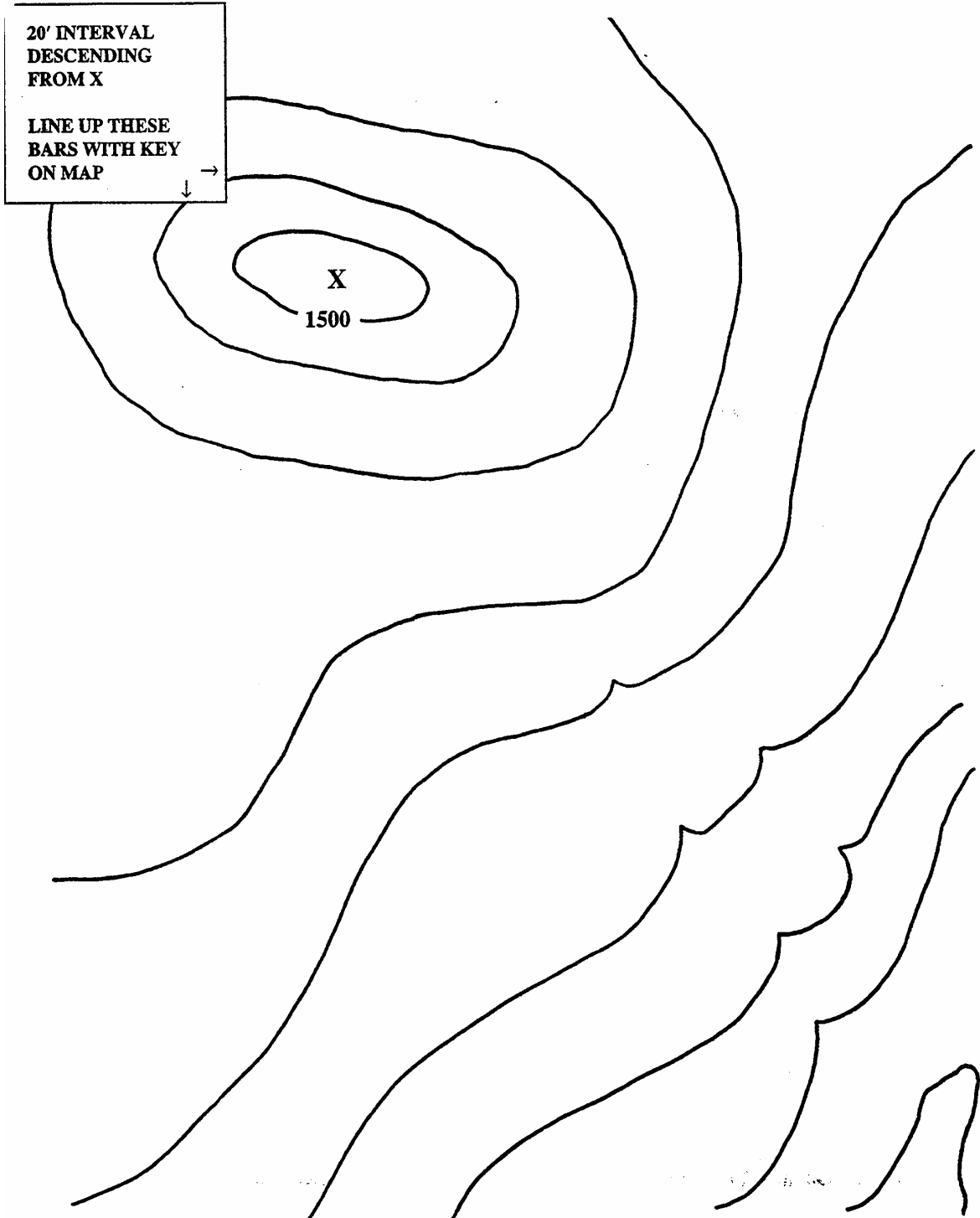
1. Access – Can trucks get to it? Can traffic be managed?
2. Zoning and land use – What is the land currently used for? Is the land more valuable for those uses? How will a landfill affect growth and development in general, and in particular, at this specific site?
3. Location – Would the presence of a landfill cause any detriment to an already established cultural feature?
4. Residence – No solid waste placement can be within 1,000 feet of a home whose owner has not consented to construction of the landfill.
5. Natural features – Generally it is unacceptable to locate solid waste landfill within 200 feet of a stream, lake or natural wetland unless proof of satisfactory diversion of stream or protection of the lake is offered.
6. Airports – If solid waste is placed within 10,000 feet of an airport serving turbine-powered aircraft or within 5,000 feet of an airport serving piston-type aircraft, the permit application must demonstrate that the facility will not pose a bird hazard to aircraft.
7. Nature preserves – A landfill cannot be located within 1000 ft of nature preserves.

# MAP OF YORETOWN AND BUCKEYE COUNTY



Investigating Solid Waste Issues, Ohio Department of Natural Resources

# TOPOGRAPHY OF TERRAIN



*Investigating Solid Waste Issues: Ohio Department of Natural Resource*

Name \_\_\_\_\_

### Site A Evaluation

**Location:**

N  NE  E  SE  S  SW  W  NW of Town

**Prevailing Wind Direction:** from NW in winter and SE in summer.

**Description of Site:** zoning and land use (residential, farming, industrial, etc.), location relative to other features (buildings, parks, etc.).

\_\_\_\_\_  
\_\_\_\_\_

**Number of Acres:** 100

**Cost Appraisal of Property:** \$900,000

**Landfill Development Costs:** \$300,000/ acre

**Soil Depth:** 4'

**Soil Type:** Silty clay

**Bedrock:** Shale

**Uppermost Aquifer:** 65'

Total Cost: \_\_\_\_\_

Access: \_\_\_\_\_

Slope and Terrain: \_\_\_\_\_

Soil Characteristics: \_\_\_\_\_

Soil Permeability: \_\_\_\_\_

Danger to Water Table: \_\_\_\_\_

Potential Direction of Odors: \_\_\_\_\_

Suitability of the Site:

Pros: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Cons: \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

Conclusion: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

### Site B Evaluation

**Location:**

N  NE  E  SE  S  SW  W  NW of Town

**Prevailing Wind Direction:** from NW in winter and SE in summer.

**Description of Site:** zoning and land use (residential, farming, industrial, etc.), location relative to other features (buildings, parks, etc.).

\_\_\_\_\_

**Number of Acres:** 80

**Cost Appraisal of Property:** \$700,000

**Landfill Development Costs:** \$280,000/ acre

**Soil Depth:** 6'

**Soil Type:** Clay

**Bedrock:** Fractured limestone

**Uppermost Aquifer:** 85'

Total Cost: \_\_\_\_\_

Access: \_\_\_\_\_

Slope and Terrain: \_\_\_\_\_

Soil Characteristics: \_\_\_\_\_

Soil Permeability: \_\_\_\_\_

Danger to Water Table: \_\_\_\_\_

Potential Direction of Odors: \_\_\_\_\_

Suitability of the Site:

Pros: \_\_\_\_\_

\_\_\_\_\_

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Cons: \_\_\_\_\_

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Conclusion: \_\_\_\_\_

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\_\_\_\_\_

Name \_\_\_\_\_

### Site C Evaluation

**Location:**

N  NE  E  SE  S  SW  W  NW of Town

**Prevailing Wind Direction:** from NW in winter and SE in summer.

**Description of Site:** zoning and land use (residential, farming, industrial, etc.), location relative to other features (buildings, parks, etc.).

\_\_\_\_\_  
\_\_\_\_\_

**Number of Acres:** 110

**Cost Appraisal of Property:** \$1,200,000

**Landfill Development Costs:** \$300,000/ acre

**Soil Depth:** 3'

**Soil Type:** Sandy loam

**Bedrock:** Clay

**Uppermost Aquifer:** 45'

Total Cost: \_\_\_\_\_

Access: \_\_\_\_\_

Slope and Terrain: \_\_\_\_\_

Soil Characteristics: \_\_\_\_\_

Soil Permeability: \_\_\_\_\_

Danger to Water Table: \_\_\_\_\_

Potential Direction of Odors: \_\_\_\_\_

Suitability of the Site:

Pros: \_\_\_\_\_

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Cons: \_\_\_\_\_

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Conclusion: \_\_\_\_\_

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\_\_\_\_\_

Name \_\_\_\_\_

### Site D Evaluation

**Location:**

N  NE  E  SE  S  SW  W  NW of Town

**Prevailing Wind Direction:** from NW in winter and SE in summer.

**Description of Site:** zoning and land use (residential, farming, industrial, etc.), location relative to other features (buildings, parks, etc.).

**Number of Acres:** 90

**Cost Appraisal of Property:** \$300,000

**Landfill Development Costs:** \$310,000/ acre

**Soil Depth:** 1'

**Soil Type:** Sand

**Bedrock:** Fractured limestone

**Uppermost Aquifer:** 35'

Total Cost: \_\_\_\_\_

Access: \_\_\_\_\_

Slope and Terrain: \_\_\_\_\_

Soil Characteristics: \_\_\_\_\_

Soil Permeability: \_\_\_\_\_

Danger to Water Table: \_\_\_\_\_

Potential Direction of Odors: \_\_\_\_\_

Suitability of the Site:

Pros: \_\_\_\_\_

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\_\_\_\_\_

Cons: \_\_\_\_\_

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\_\_\_\_\_

Conclusion: \_\_\_\_\_

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\_\_\_\_\_



Name \_\_\_\_\_

**LANDFILL SITE COMPARISON**

<b>Goals</b>	<b>Location</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Cost				
Road Access				
Zoning				
Slope				
Soil Depth				
Soil Type				
Soil Permeability				
Bedrock				
Aquifer Depth				
Danger to Groundwater				
Odors to town				
Is the site > 1000 ft from homes?				
Is the site > 2000 ft from airport?				
Is the site >200 ft from river?				
Is the site > 1000 ft from nature preserve?				
Distance of Wells or Mines from site				
Is the site near Public buildings?				