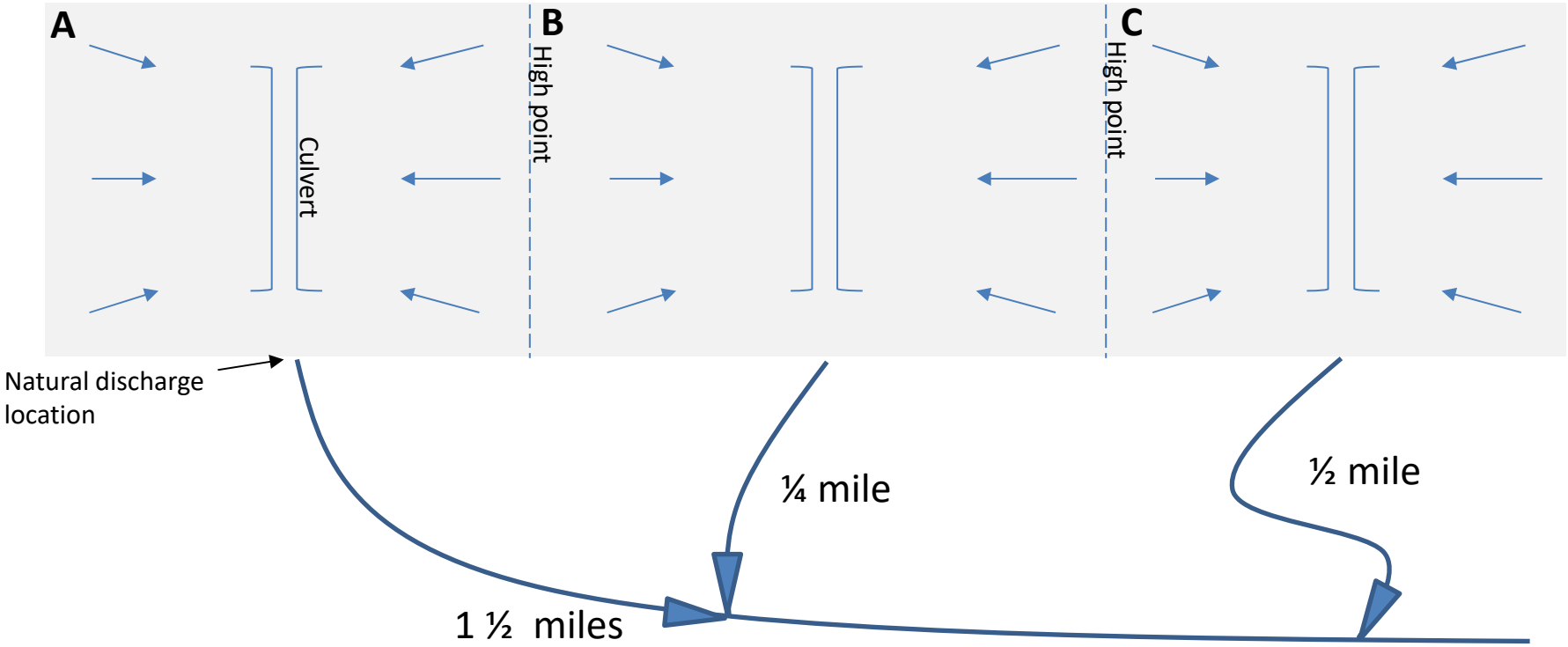
Breakout Exercise #1

Breakout Exercise #1

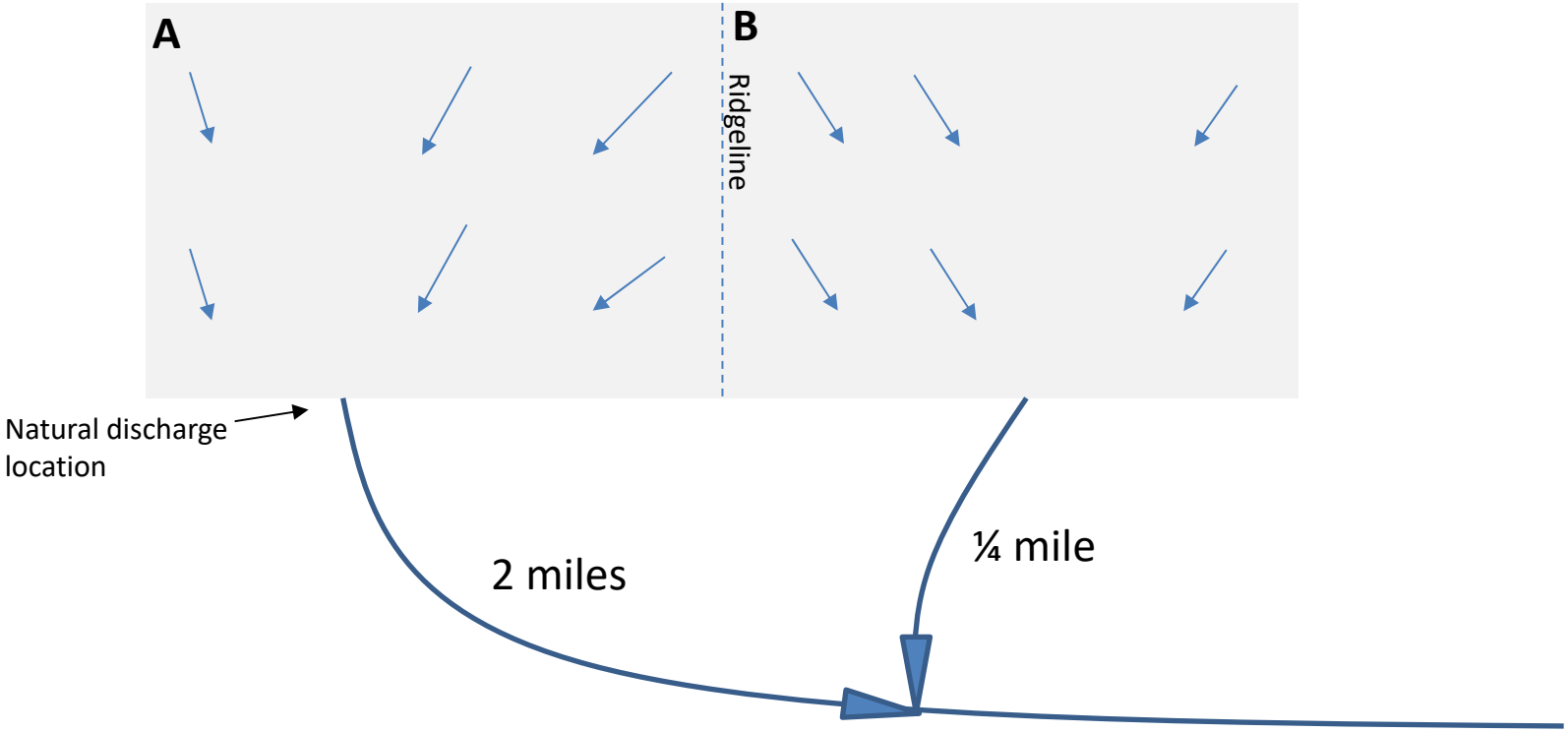
- **Objective**
  - Determine Threshold Discharge Area delineation
  - 2 hypothetical projects
- **Timing**
  - 10 minutes to complete (in breakout groups)
  - 5 minutes to review results (breakout group leads to report results)
- **Information**
  - See slides 26-29 in your breakout exercise packet

Breakout Exercise #1a



Total project area: 10 acres
Residential, outside UA and UGA

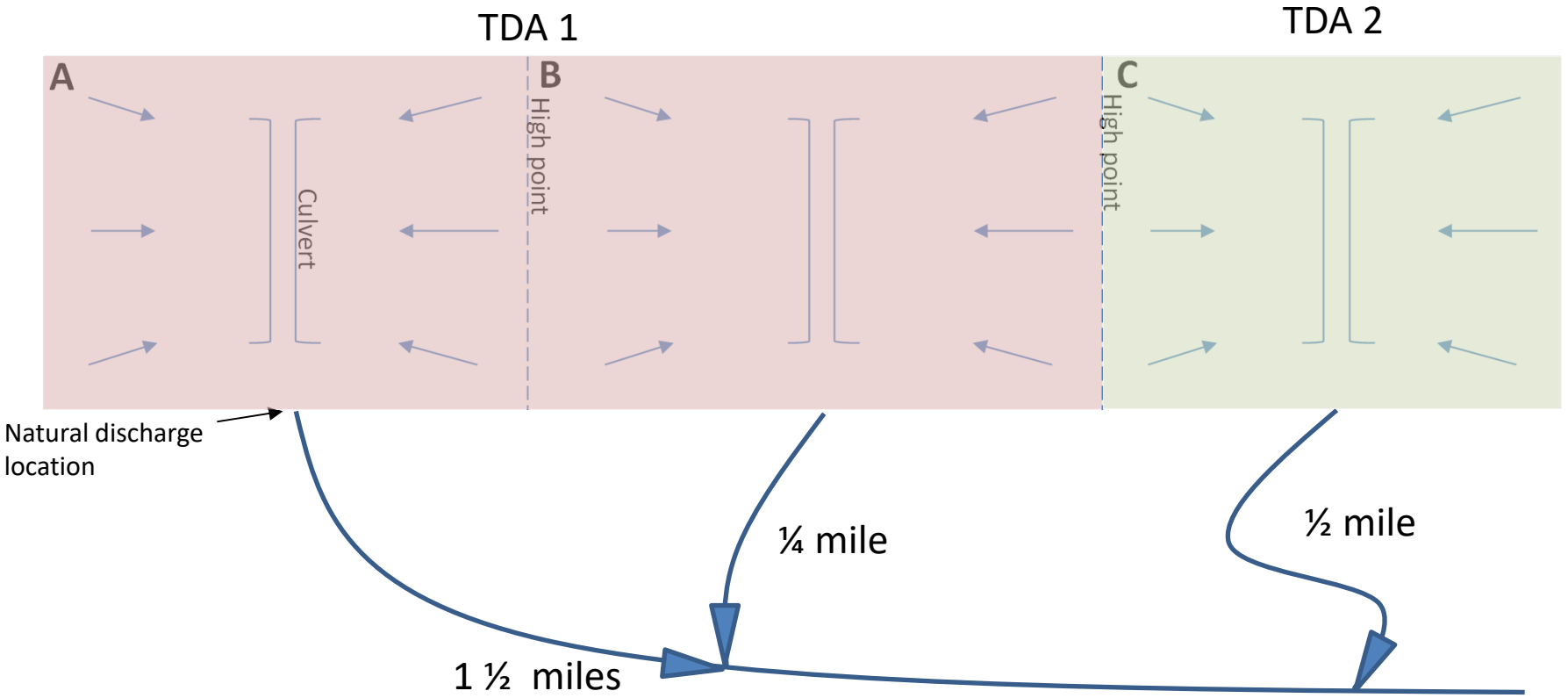
Breakout Exercise #1b



Total project area: 4 acres
Residential, outside UA and UGA

Breakout Exercise #1 Group Discussion

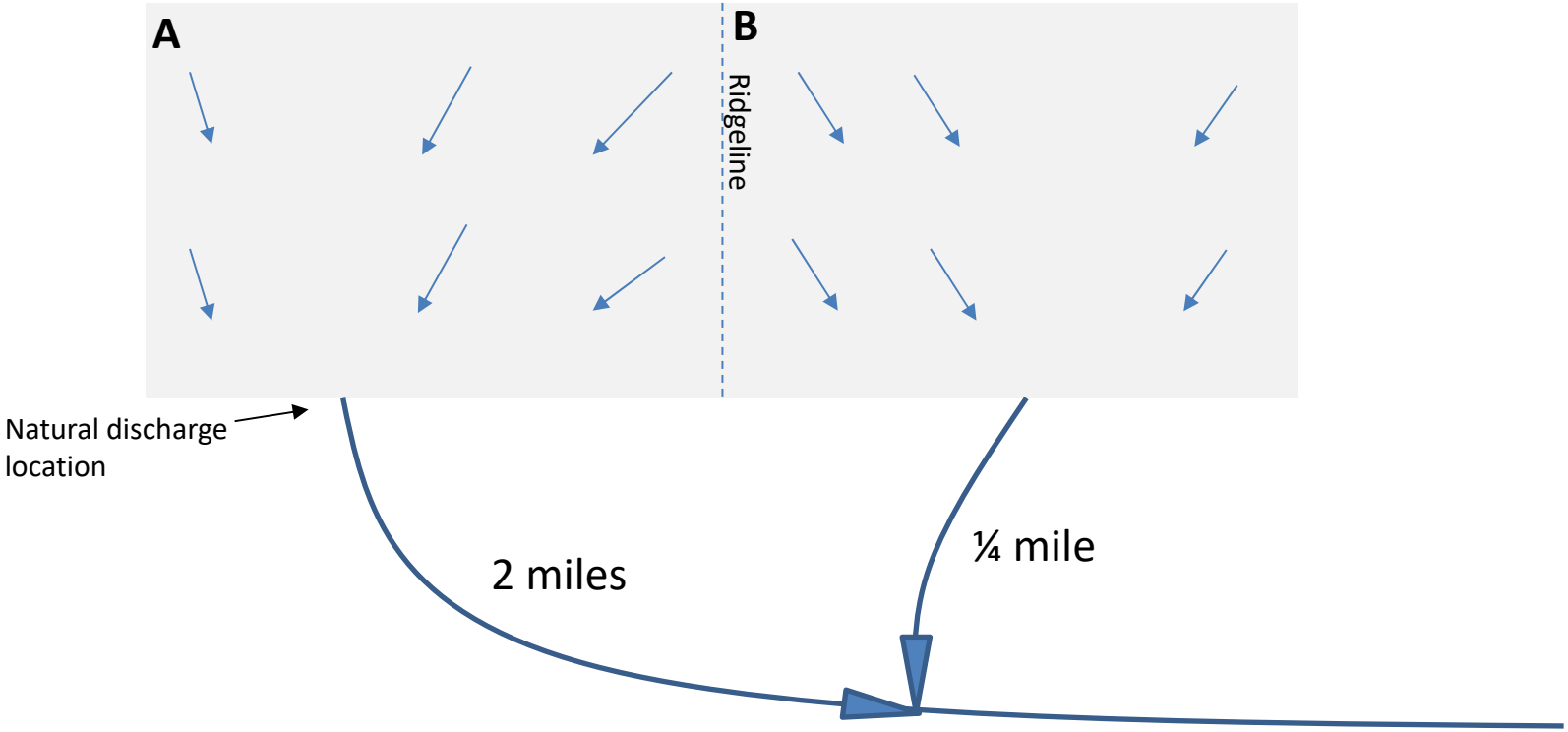
Breakout Exercise #1a



Total project area: 10 acres
Residential, outside UA and UGA

Breakout Exercise #1b

No TDAs delineated because the project area is less than 5 acres.



Total project area: 4 acres
Residential, outside UA and UGA

Breakout Exercise #2

Breakout Exercise #2

- **Objective**
  - Identify allowable infiltration testing methods
  - 4 hypothetical projects
- **Timing**
  - 10 minutes to complete (in breakout groups)
  - 5 minutes to review results (breakout group leads to report results)
- **Information**
  - See slides 52-54 in your breakout exercise packet
  - Use online SDM: http://d73um4zgzsxwp.cloudfront.net/KitsapSDM/Default.htm

Breakout Exercise #2a-2d

Determine infiltration testing requirements for the following projects:

Hypothetical Project	Type	Impervious Area Added (SF)
2a	Rural residential	1,500 SF
2b	Non-rural residential	1,500 SF
2c	Rural residential	20,000 SF
2d	Non-rural residential	20,000 SF

Hint: Search "Minimum Investigation"

OR Search "Subsurface Investigation" with filter on for Volume II, Chapter 5

Breakout Exercise #2 Group Discussion

Breakout Exercise #2 Discussion

- **Table II-5.4**
- Project 2a: Simple Infiltration Test or Grain Size Analysis
- Project 2b: Small PIT
- Project 2c: Small PIT or Grain Size Analysis
- Project 2d: Small PIT

Table II-5.4. Summary of Minimum Investigation and Testing Requirements for Shallow Infiltration BMPs, Steps 2, 3, and 5.[a]

Impervious Area Infiltrated on the Project Site	Step 2		Step 3		Step 5			
	Subsurface Investigation		Infiltration Testing		Groundwater Monitoring		Characterization of Infiltration Receptor	Groundwater Mounding and Seepage Analysis
	Minimum Number	Type	Minimum Number	Type	Minimum Number of Wells	Duration and Frequency		
<2,000 ft^2		Simple subsurface investigation	**For Grain Size Analysis:** At least one per 5,000 square feet of infiltration basin (BMP T7.10) AND at least one per 200 linear feet of trench length (BMP T7.20) AND in no case fewer than 2 tests per BMP **For all other test types:** 1 per BMP AND at least 1 per 150 linear feet of a BMP[e,f]	Simple Infiltration Test[b] or Grain Size Analysis[c,d]	0	NA	No	No
≥2,000 to <5,000 ft^2	1 per BMP AND at least 1 per 150 linear feet of a BMP[e,f]	Standard subsurface investigation		Simple Infiltration Test[b], Grain Size Analysis[c,d], or Small Pilot Infiltration Test (PIT); if ≥2,000 ft^2 of the site infiltration will occur within a single BMP[g], the Small PIT[d] method is required	0	NA	No	No
≥5,000 to <10,000 ft^2		Comprehensive subsurface investigation[h]		Small PIT[d] or Grain Size Analysis[c,d]	1	Monthly for at least 1 wet season; monthly for at least 1 year if within 200 feet of a designated receiving water[i]		
≥10,000 ft^2 to <1 acre				Small PIT[d] or Grain Size Analysis[c,d]	3		Yes, for infiltration basins	No
≥1 acre				Large PIT[d] or Grain Size Analysis[c,d]				Yes[j]

Notes:

a. Deviations from the minimum requirements in this table, when recommended and documented by the licensed professional, may be approved by the director. If the licensed professional determines continuity or subsurface materials based on site investigations or if infiltration testing will be done during construction, then fewer tests may be approved. Designs for infiltration BMPs shall provide allowances for review and update during construction if site conditions differ than assumed during design or if infiltration test during construction (as specified in the designs) determines that the infiltration rate is lower than assumed for the designTab.

b. The Simple Infiltration Test is not allowed for projects with no offsite point of discharge. The Simple Infiltration Test is only allowed for project sites located in rural areas (outside the UGA and UA), with the drainage area limitations listed in this table. The Small PIT or Large PIT shall be used where the Simple Infiltration Test is not applicable or not allowed.

c. Grain Size Analysis is allowed for rural (outside the UA and UGA) residential project sites and can only be used if the site has soils unconsolidated by glacial advance. Refer to Volume V, Section V-5.5 of the Ecology Manual for additional guidance.

d. The investigation and infiltration testing report shall be prepared by a licensed professional. See Volume II, Chapter 1 for report requirements.

e. For bioretention or rain gardens, a BMP refers to either a single cell, or a series of cells sized to meet applicable standards.

f. The investigation shall be conducted at the location of the proposed infiltration BMP whenever possible. When not possible to conduct the investigation at the proposed BMP location, it shall be conducted within 50 feet of the proposed BMP location.

g. A single BMP is defined as a BMP that has at least a 10-foot separation distance from another infiltration BMP, measured from the closest vertical extent of maximum ponding before overflow, or for bioretention and rain gardens, the maximum vertical extent of the top of the bioretention soil or compost amended soil.

h. The investigation and infiltration testing report shall be prepared by a licensed professional. See Volume II, Chapter 1 for report requirements.

i. For projects where runoff from 5,000 square feet or more of impervious surface area will be infiltrated on the site, infiltration within 500 feet up-gradient or 100 feet down-gradient of a contaminated site or landfill (active or closed) requires analysis and approval by a licensed hydrogeologist.

j. If the project site is within 200 feet of tidal waters, groundwater data capturing low/high tide fluctuation for one wet season shall be collected to determine if groundwater at the project is influenced by tidal fluctuations. Groundwater monitoring is not required if available groundwater elevation data within 50 feet of the proposed BMP shows the highest measured groundwater level to be at least 10 feet below the bottom of the proposed infiltration BMP or if the initial groundwater measurement is more than 15 feet below the bottom of the proposed infiltration BMP.

k. Groundwater mounding and seepage analysis is required where the depth to the seasonal high groundwater elevation or hydraulically restrictive material is less than 15 feet below the bottom of the proposed infiltration BMP.