Parametrix, Inc. *Consultants in Engineering and Environmental Services*

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February 22, 1991
55-1550-26(35)

Ms. Lin Robinson
Seattle Engineering Department
Solid Waste Utility
505 Dexter Horton Building
Seattle, WA 98104

re: Methane Gas at Corner of Pacific Highway South and South 252nd Street

Dear Ms. Robinson:

This letter addresses our analysis of the methane gas found by Kleinfelder at the property on the southwest corner of Pacific Highway S. and S. 252nd Street.

Background

On January 21, 1991, Kleinfelder, Inc. prepared a report for Mr. Harvey L. Grohs describing subsurface gas sampling at the property described above. This report identified the Midway Landfill as a potential source of methane gas discovered at the site. The Midway Landfill is located nearly 1,000 feet northeast of the property.

The Kleinfelder report indicated that gasoline odors were noted during geotechnical drilling activities on the site in February 1990. A soil sampling program conducted in October 1990 indicated the presence of total petroleum hydrocarbons (TPH) at low levels in all soil samples from the site. During this soil investigation, high flame ionization detector and explosimeter readings were observed in two of the soil vapor probes. In December 1990, Kleinfelder collected three subsurface soil vapor samples. These samples indicated the presence of methane at concentrations up to 42,937 ppm, TPH up to 466 mg/m^3, and the presence of several volatile organic compounds at low levels.

Recent Site Investigations

On January 29, Bob Crandall, Seattle Solid Waste Utility looked at the area surrounding the site in question. He noted that the area immediately west of the site is a large bog/swamp. Typically these types of areas contain large volumes of decomposing organic matter that can produce methane. Also, there are Washington Natural Gas pipelines running along Pacific Highway S. and S. 252nd Street. Mr. Crandall also found a "No Dumping" sign on the property, indicating there may have been illegal dumping activities on the site in the past, although no exposed refuse was identified.

Historical Data Review

During the Remedial Investigation of the Midway Landfill, several geologic cross sections of the vicinity surrounding the Midway Landfill were prepared. Copies of those cross sections most relevant to the area in question are included with this letter. These cross sections indicate that there is no shallow continuous gas bearing geologic formation between the landfill and the site at Pacific Highway S. and S. 252nd.

Also included with this letter are graphs of all methane monitoring data performed on several shallow gas probes in the vicinity of Pacific Highway S. and S. 252nd St for the past several years. While these graphs indicate varying levels of methane present in shallow off-site soils in this area, the data is consistently in the very low part-per-million range. Prior to the Kleinfelder investigations, 11,000 ppm was the highest recorded methane concentration ever recorded in the area. This level was recorded in probe 18-S in August 1987, but this level quickly reduced to the 2,000 ppm range by the end of 1988 when the probe was destroyed. For the most part, all shallow probes in the area historically have indicated methane in the 10 to 1,000 ppm range. Most of these graphs also indicate a general downward trend in methane concentrations off-site over the past several years.

Conclusions and Recommendations

Based on the information presented above, it is unlikely that the methane observed at the property at the southwest corner of Pacific Highway S. and S. 252nd Street originated at the Midway Landfill. Historically, no shallow methane migration has been observed in this area in the levels identified in the Kleinfelder report. Also, all indications from off-site monitoring performed over the past several years indicate that the on-site migration control system at the Midway Landfill has been quite effective in drawing previously migrated landfill gas back to the landfill, as well as preventing any further methane migration.

Based on our review of the Kleinfelder report as well as subsequent site visits, it is likely that there may be several sources of explosive gas near the site. These sources include:

- The large bog/swamp to the west of the site
- Possible leaks in underground Washington Natural Gas Transmission lines in the area
- Illegal dumping in the past at the site
- Organic material mixed with the fill dirt at the site
- Leaking underground gasoline or diesel storage tanks near the site

It is our recommendation that Kleinfelder investigate these potential sources of the methane and TPH found at the site and amend their report as necessary.

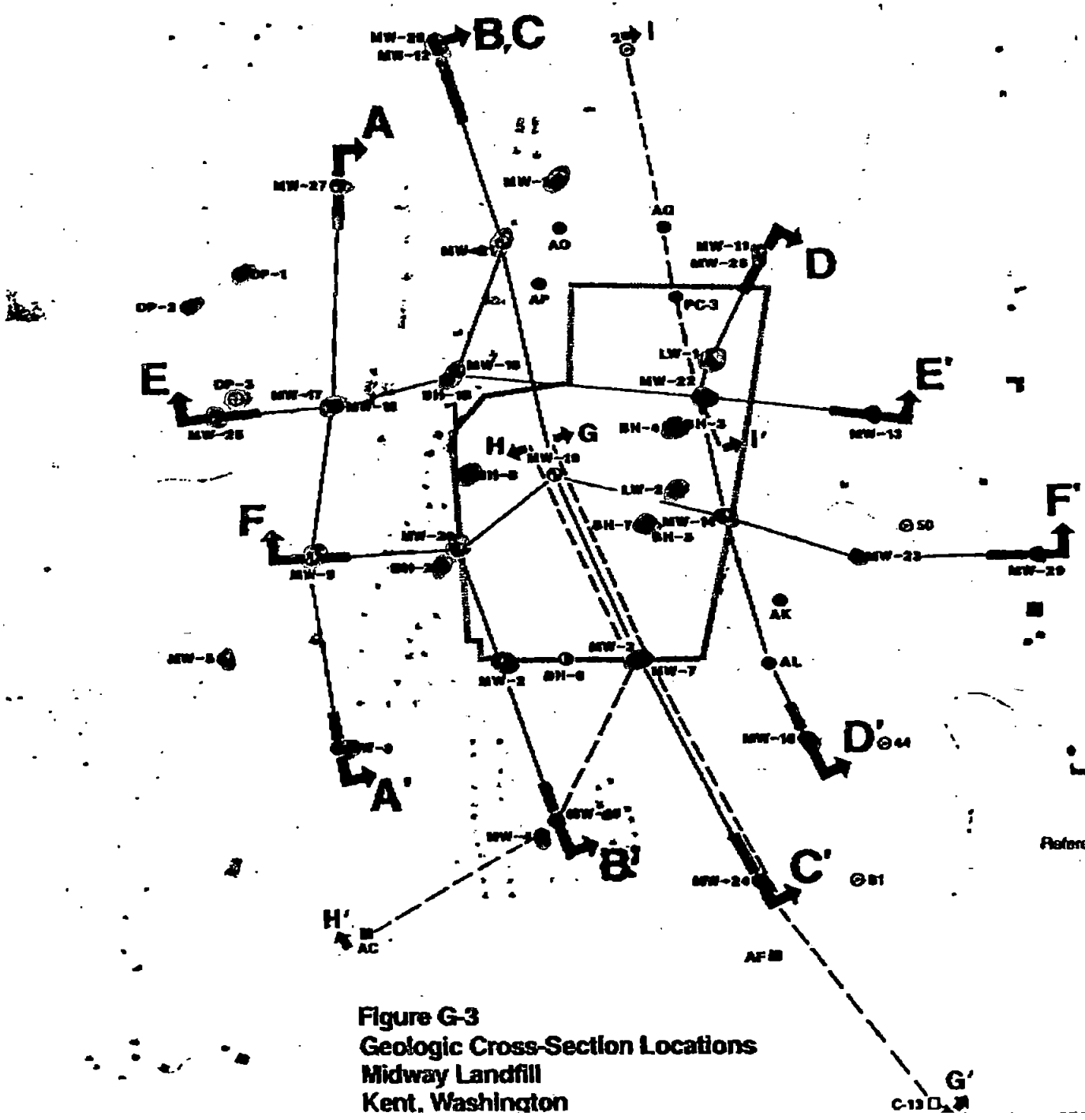
Parametrix was able to identify several Washington Natural Gas pipeline leaks during our remedial investigation of the Midway Landfill. We recommend that Kleinfelder analyze the gas found at the site for the presence of propane and ethane. Washington Natural Gas maintains up-to-date records on the ratio of propane, ethane and methane in their gas transmission lines. Parametrix was able to "fingerprint" gas from leaking transmission lines by comparing the propane, ethane, methane ratio in the gas sample to WNGs records.

If we can be of any further assistance on this matter, please do not hesitate to call.

Sincerely,

PARAMETRIX, INC.

William F. Sullivan
Project Manager



C-13 Gas Control Well Installed by Applied Geo Technology, 1986

2 Gas Probe Installed by Hart-Crowser, 1985, 1986

LW-1 Leachate Extraction Well Installed by Applied Geotechnology, 1987

DP-1 Drive Point Groundwater Monitoring Well Installed in Parkside Wetland by Applied Geotechnology, 1987

AL Gas Probe Installed by Parametrix, 1987, 1988

AM Gas Probe Installed by Terra Associates, 1986

Groundwater Monitoring Well Location and Number:

BH-1 BH Wells Installed by Golder Associates, 1982

MW-1 MW1A-MW6 Wells Installed by Golder Associates, 1985

MW-7 MW7-MW29 Wells Installed by Applied Geotechnology, 1987

Approximate Boundary of Midway Landfill

Geologic Cross Section Location

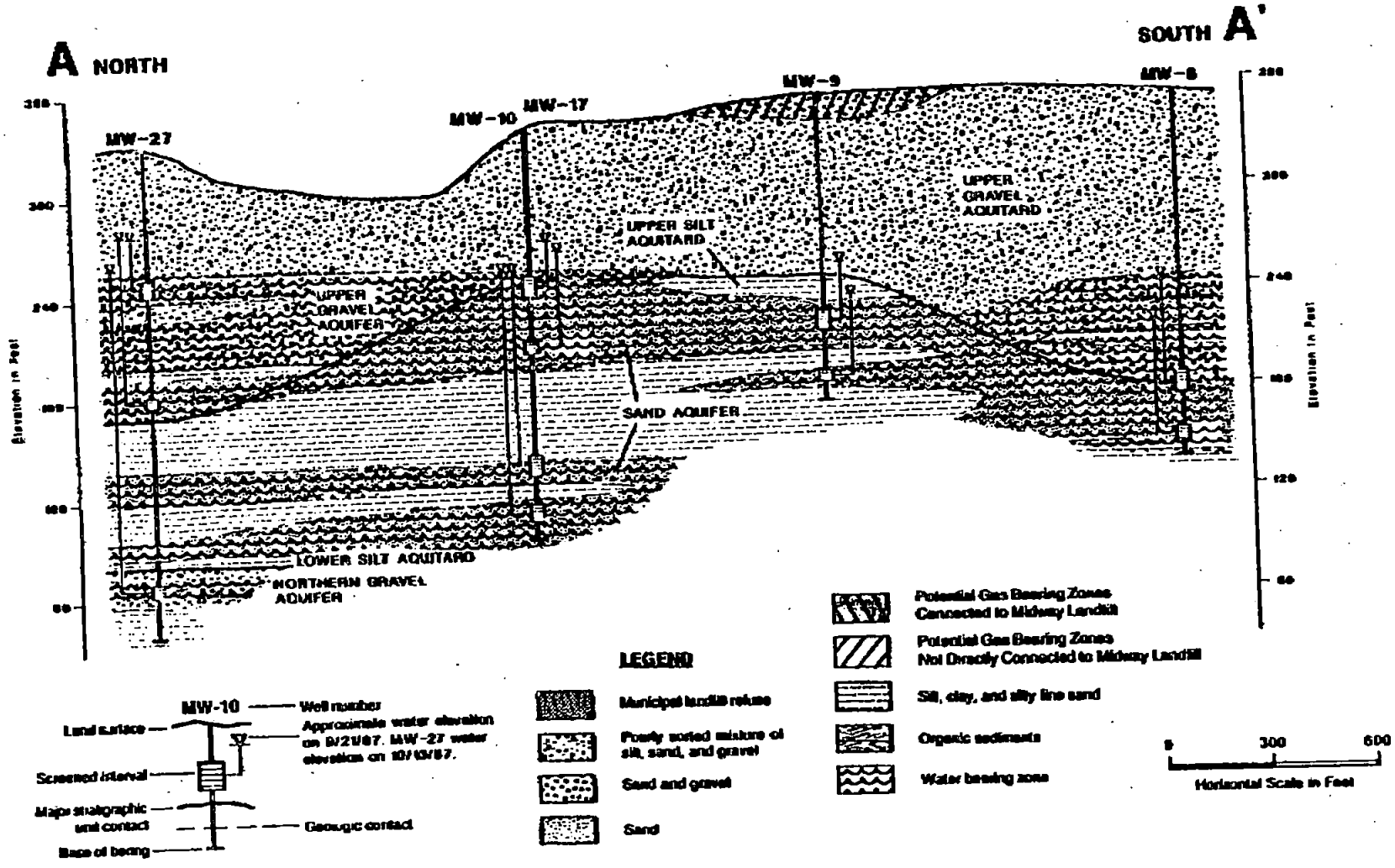
0 500 1000

SCALE IN FEET

N

Reference: USGS 7.5 Minute Poverty Bay and Des Moines Quadrangles. Photorevised 1973 and 1981, respectively.

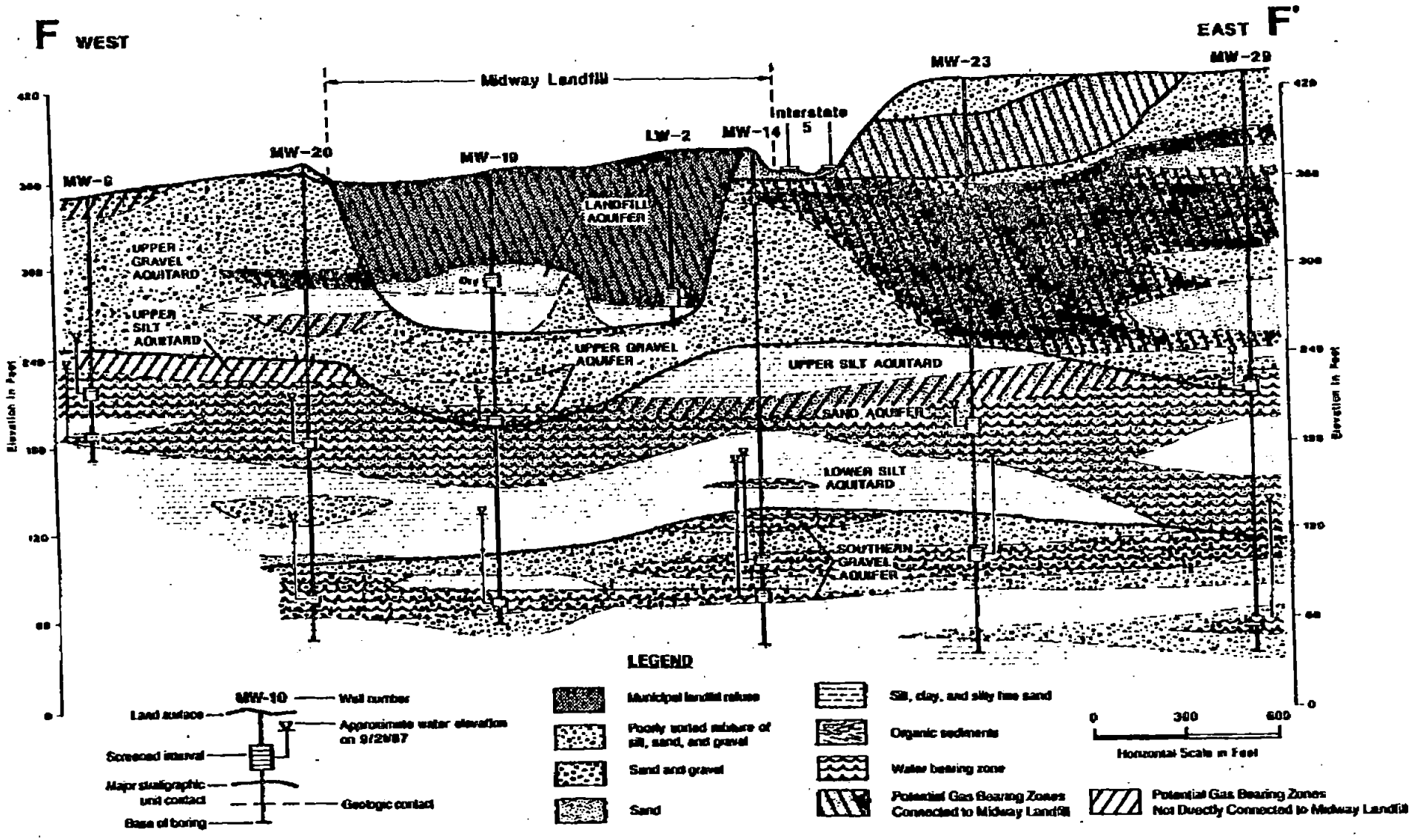
Figure G-3
Geologic Cross-Section Locations
Midway Landfill
Kent, Washington



NOTES:

1. For cross section location refer to Figure G1.
2. This cross section is a diagrammatic interpretation of subsurface conditions based on interpolation and extrapolation between borings. Geologic and hydrologic conditions are substantially more complex than depicted.

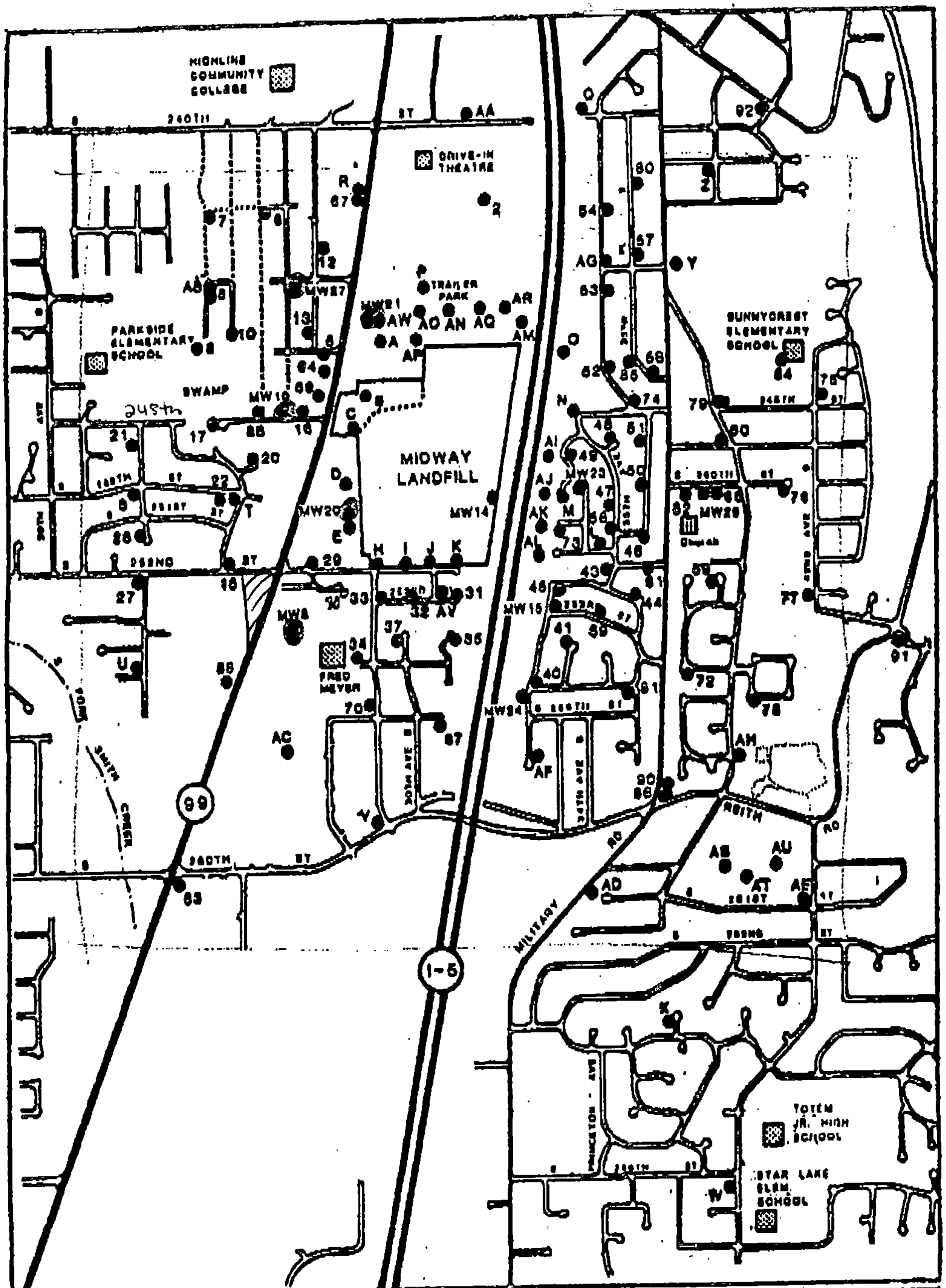
Figure G-4
Potential Gas Migration Pathways
Hydrogeologic Section A-A'
Midway Landfill
Kent, Washington



NOTES:

1. For cross section location refer to Figure G1.
2. This cross section is a diagrammatic interpretation of subsurface conditions based on interpolation and extrapolation between borings. Geologic and hydrologic conditions are substantially more complex than depicted.

Figure G-9
Potential Gas Migration Pathways
Hydrogeologic Section F-F'
Midway Landfill
Kent, Washington



Midway Landfill
Location of Gas Probes