

RECEIVED
D.E.M. / O.W.M.

September 20, 2004

2004 SEP 22 A 11: 52

081-12152-01

Mr. Jeffrey Crawford
Rhode Island Department of Environmental Management
Office of Waste Management
235 Promenade Street
Providence, RI 02908-5767

Subject: Additional Soil Gas Monitoring at Springfield Street School Complex, 50
Springfield Street, Providence, RI – September 2004

Dear Mr. Crawford:

Per our recommendation in the last Quarterly report, LFR Levine Fricke conducted monitoring of methane, carbon dioxide, and oxygen in the soil gas monitoring wells at the Springfield Street School Site on September 14 and 15, 2004. The results this recent round of quarterly monitoring is presented in the attached table, along with the results of the August 2004 monitoring round. We have also updated the trend graphs for selected wells which were presented before and these are also attached.

Methane was not detected in samples from any of the soil gas monitoring wells during this round of monitoring. Carbon dioxide concentrations in soil gas exceeded the action levels in 23 of 29 soil gas monitoring points, compared to 24 exceedances in August. Carbon dioxide concentrations were higher at 16 monitoring points, and lower at 9 monitoring points. The highest concentrations of carbon dioxide were again detected in the monitoring points at the northern end of the Site between the middle school parking lot and Hartford Avenue. Oxygen concentrations generally continued to vary inversely with carbon dioxide concentrations.

As we have stated previously, we believe that the carbon dioxide concentrations do not represent a threat to users of the property. Carbon dioxide is heavier than air, and will not rise into site buildings, which are on or above grade. In addition, the sub-slab venting systems operating at the schools prevents infiltration of soil gas into the Site buildings.

We believe that the concentrations of carbon dioxide detected at the Site are a result of activity by naturally occurring bacteria in the soil of the Site. As noted in the article we sent under separate cover, this phenomena of increased carbon dioxide concentrations has been documented at golf courses as a naturally occurring process. As noted in the article, carbon dioxide concentrations increase in the summer and fall because increased temperatures promote bacterial growth.

MR. JEFFERY CRAWFORD

Rhode Island Department Environmental Management

September 20, 2004

Page 2



We will measure methane, carbon dioxide and oxygen in soil gas again in one month to continue to monitor the trends at the Site, and we will report those results to you. Please call me if you have questions.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Donna H. Pallister'.

Donna Holden Pallister, P.E.
Senior Engineer

A handwritten signature in cursive script, appearing to read 'Thomas L. Daley'.

Thomas L. Daley
Senior Engineer

Cc: A. Sepe, City of Providence
R. Troiano, PPBA
J. Boffa, Providence School Department

**Soil Gas Survey Results
Springfield Street School Complex
Providence, Rhode Island
August and September, 2004**

Monitoring Well	Methane % by volume		Carbon Dioxide % by volume		Oxygen % by volume	
	August	September	August	September	August	September
WB-1	0.0	0.0	4.0	5.0	10.7	14.1
WB-2	0.0	0.0	0.5	1.0	19.6	20.1
WB-3	0.0	0.0	2.1	0.0	16.6	20.9
WB-4	0.0	0.0	0.0	0.0	20.7	20.8
WB-5	0.0	0.0	0.0	0.0	20.6	20.6
WB-6	0.0	0.0	0.0	0.0	20.5	20.6
WB-7	0.0	0.0	0.0	0.0	20.4	20.6
WB-8	0.0	0.0	0.4	0.6	19.6	20.0
WB-12	0.0	0.0	1.5	2.4	18.2	19.7
WB-13	0.0	0.0	4.6	5.0	13.5	15.7
WB-14	0.0	0.0	1.2	2.2	18.1	19.6
WB-15	0.0	0.0	2.7	3.3	16.3	18.3
EPL-1	0.0	0.0	0.7	3.2	19.7	19.0
EPL-2	0.0	0.0	1.1	2.3	18.1	19.3
EPL-3	0.0	0.0	6.1	1.6	12.7	19.2
EPL-4	0.0	0.0	6.3	2.1	11.4	15.6
EPL-5	0.0	0.0	8.8	2.2	6.8	17.7
ENE-1	0.0	0.0	1.5	1.1	16.5	20.5
MG1	0.0	0.0	0.9	1.6	17.4	17.8
MG2	0.0	0.0	2.5	0.4	16.6	20.9
MG3	0.0	0.0	2.7	3.1	16.0	18.1
MG4	0.0	0.0	1.9	2.7	16.2	17.9
MG5	0.0	0.0	3.1	2.6	12.5	17.1
MPL2	0.0	0.0	1.3	0.0	18.2	21.1
MPL3	0.0	0.0	8.6	10.8	7.2	3.3
MPL5	0.0	0.0	10.0	12.2	6.4	3.7
MPL6	0.0	0.0	13.0	13.7	6.9	3.9

**Soil Gas Survey Results
Springfield Street School Complex
Providence, Rhode Island
August and September, 2004**

Monitoring Well	Methane % by volume		Carbon Dioxide % by volume		Oxygen % by volume	
	August	September	August	September	August	September
MPL7	0.0	0.0	11.9	13.6	6.9	3.7
MPL8	0.0	0.0	7.7	5.8	10.2	13.1
Remedial Action Work Plan Action Levels	0.5%		1,000 PPM (0.1%)		NA	

Notes:

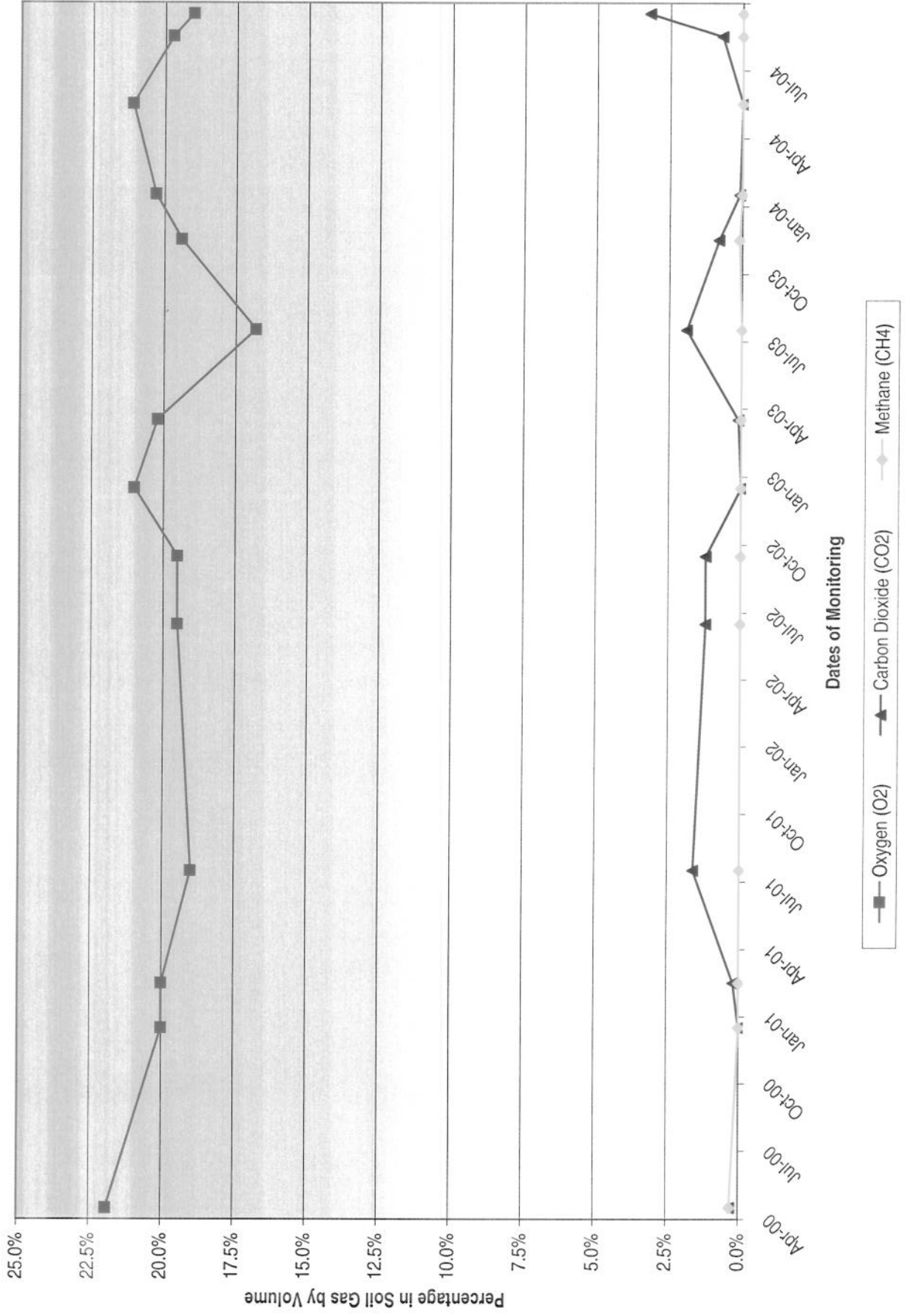
Samples collected August 16 & 17, 2004, and September 14 & 15, 2004

Sampling Equipment: LandTec GA90

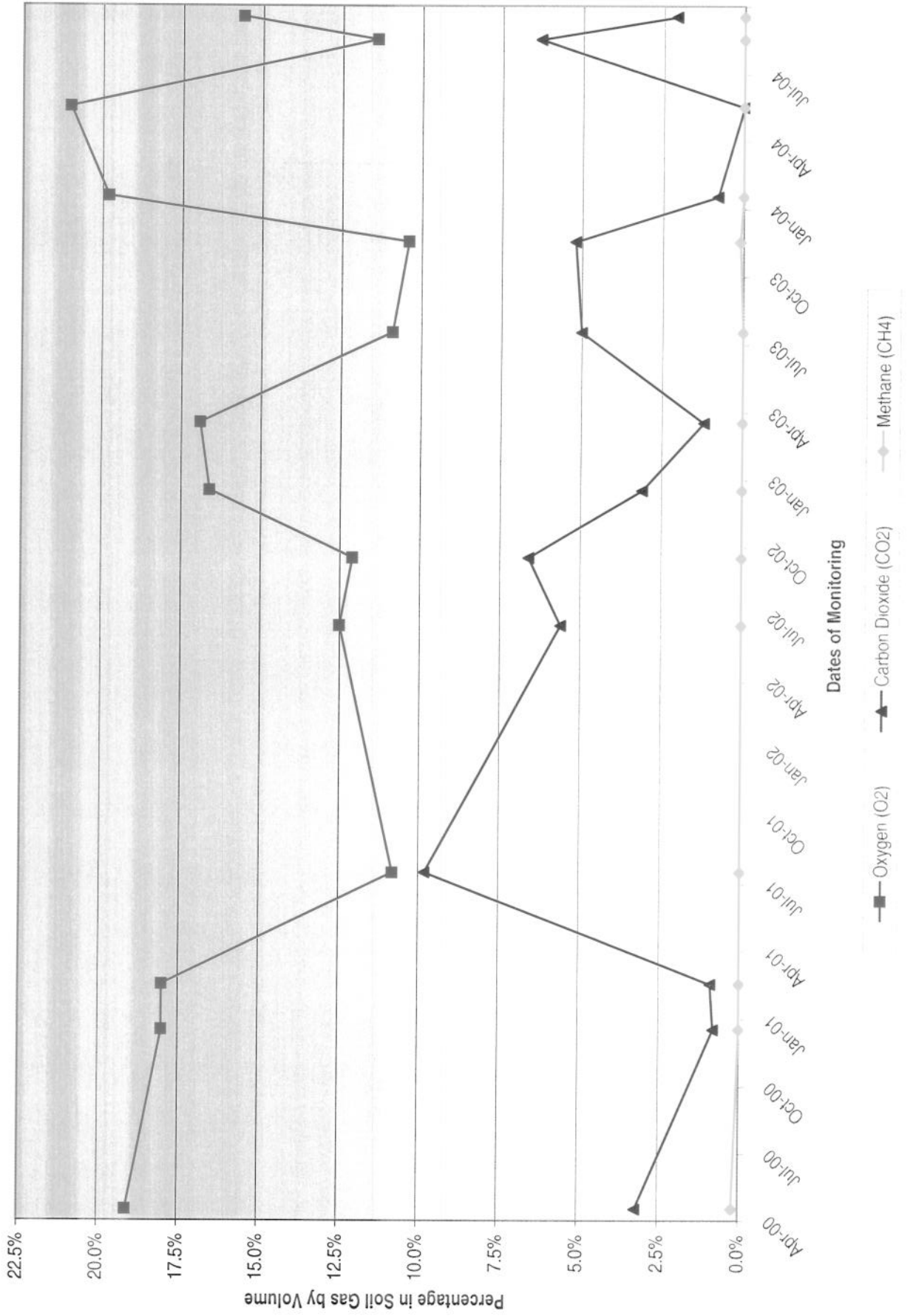
PPM = parts per million

Trend Graphs for Selected Monitoring Points

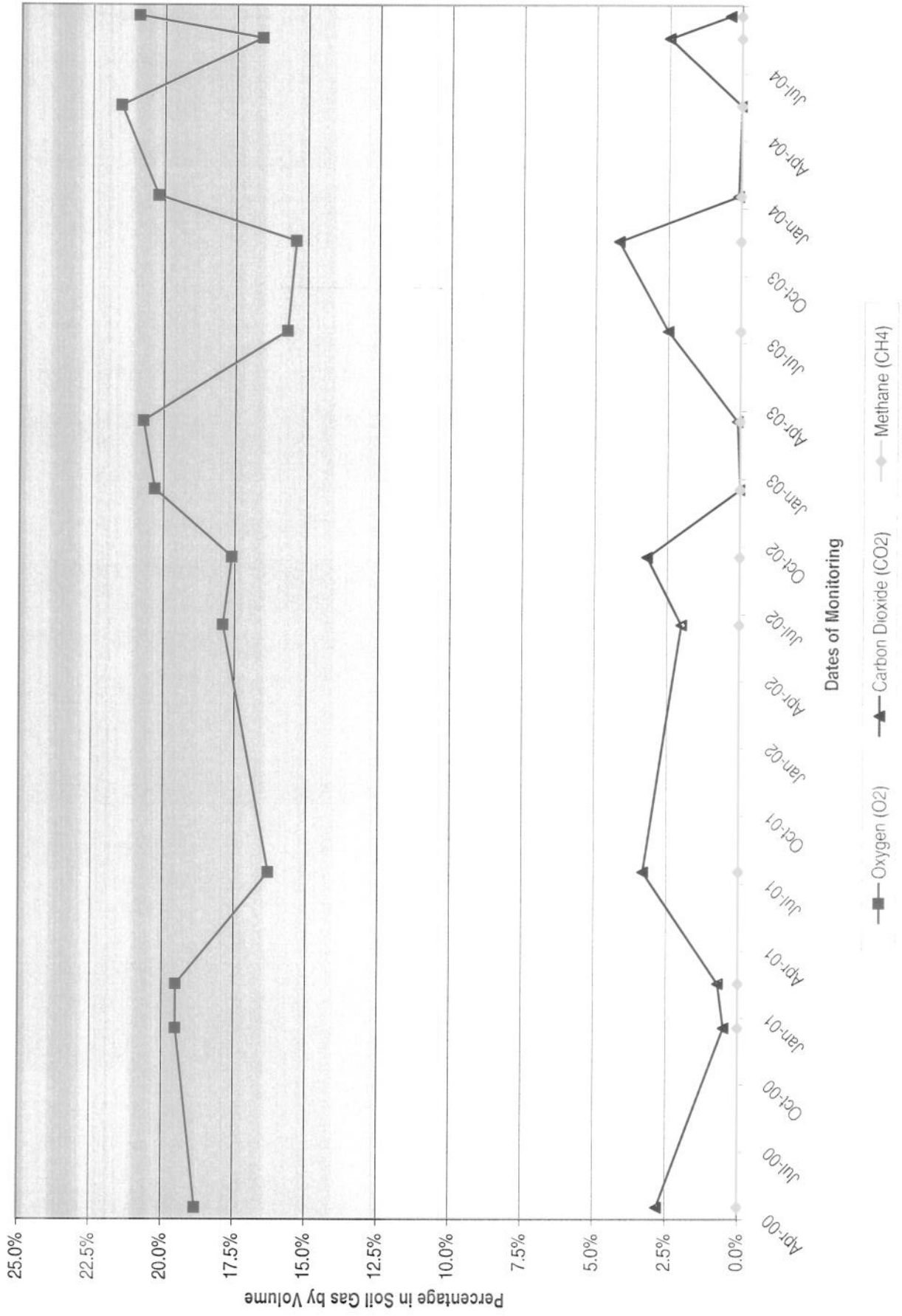
Soil Gas Well EPL1
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



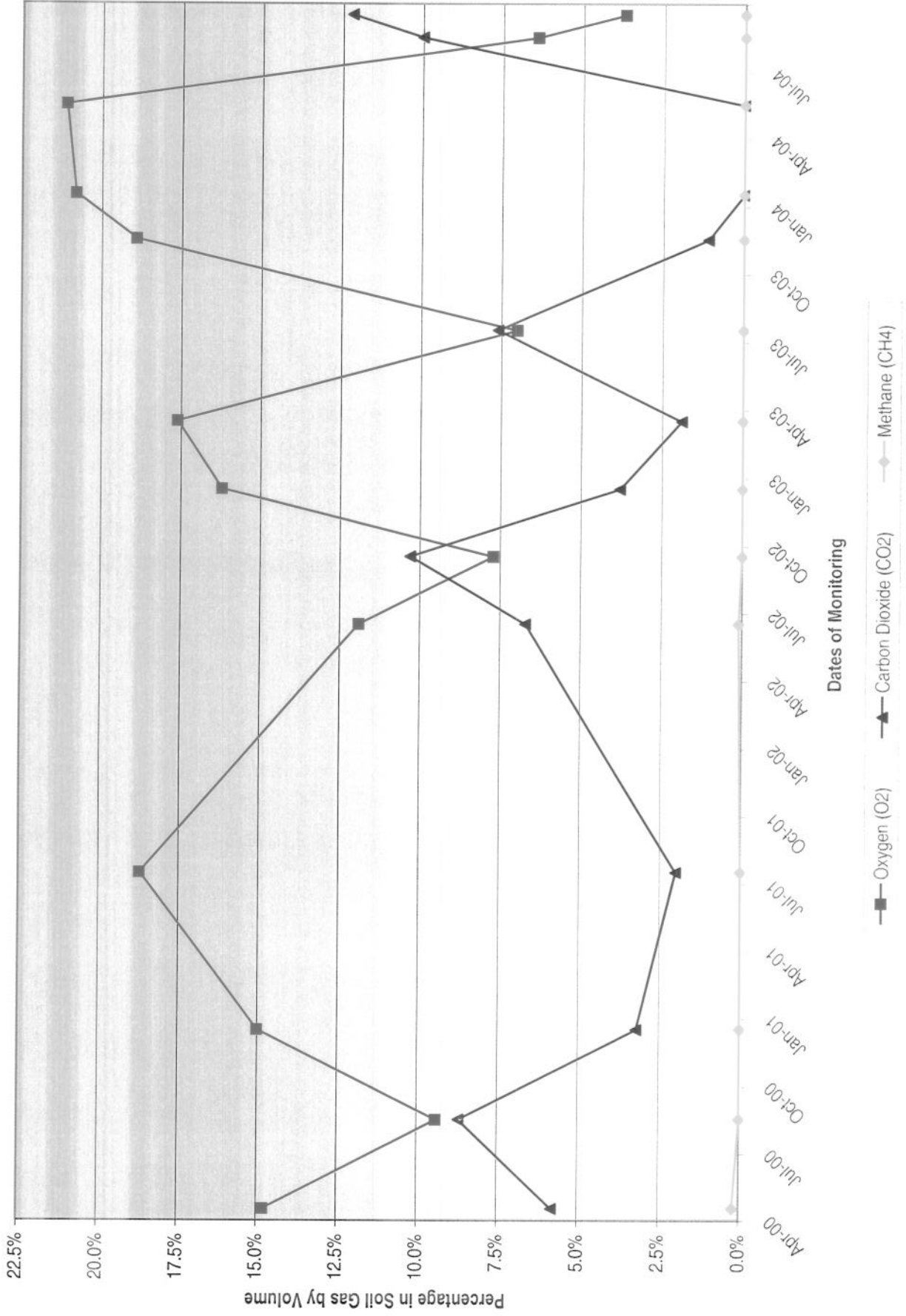
Soil Gas Well EPL4
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



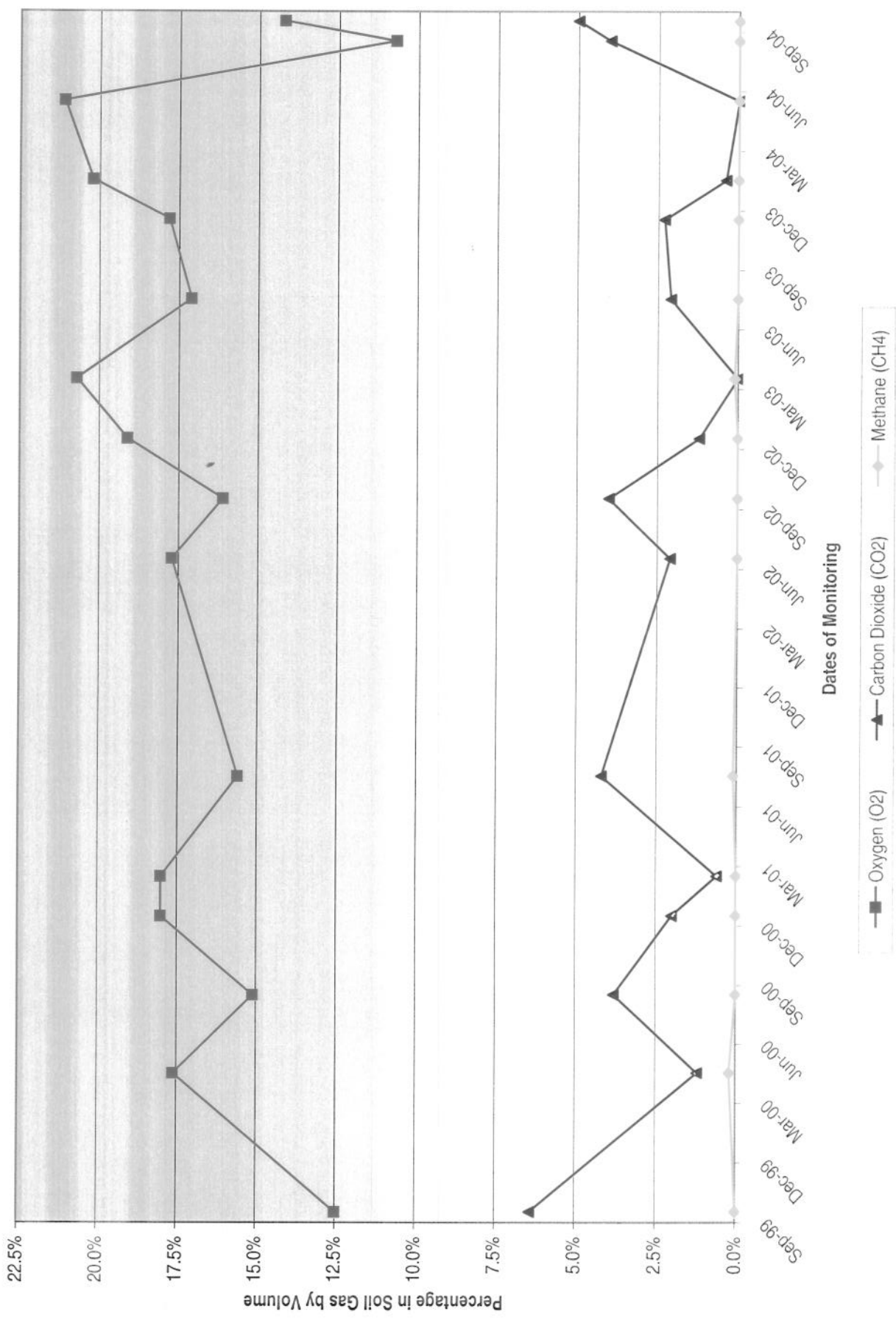
Soil Gas Well MG2
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



Soil Gas Well MPL5
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



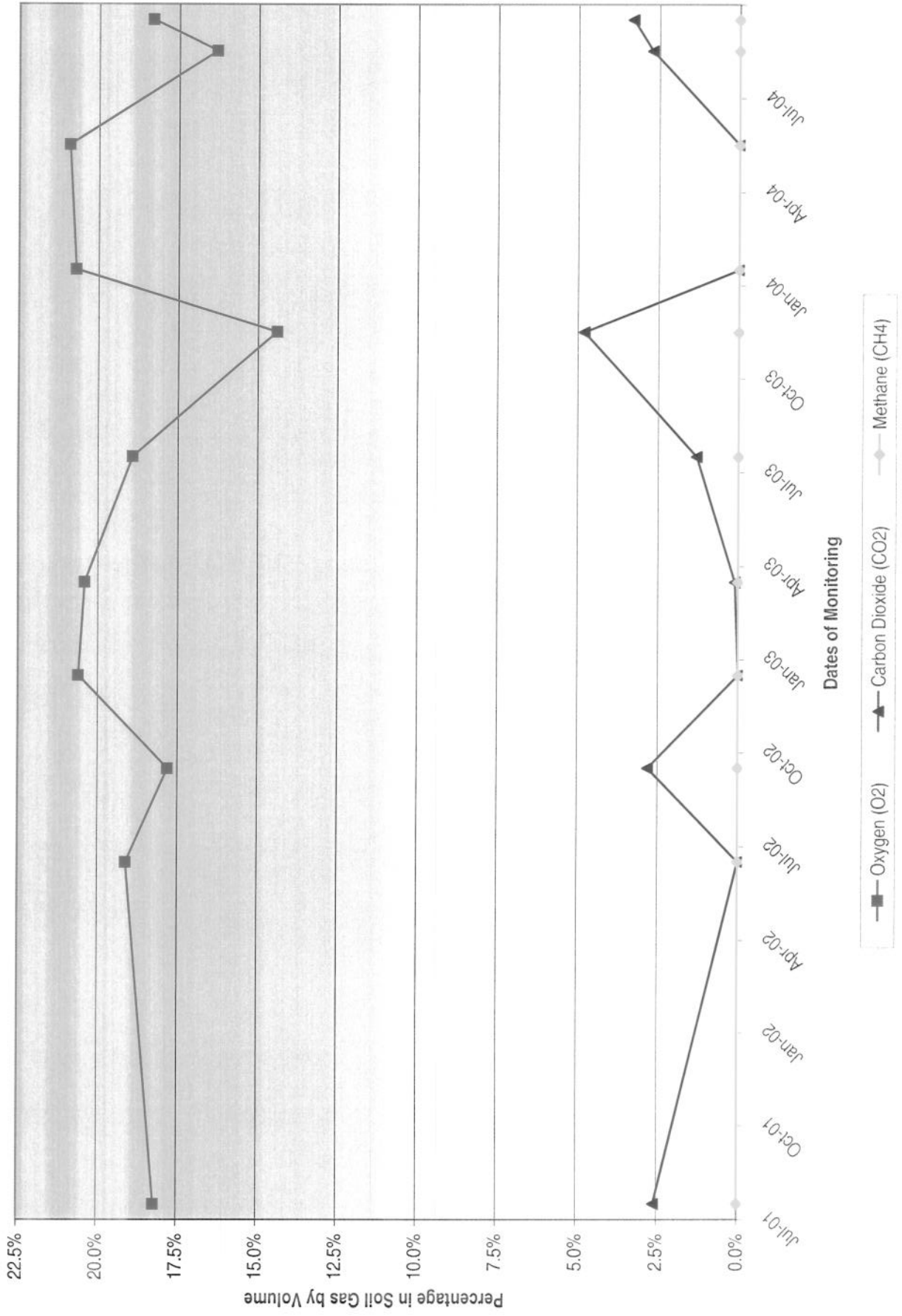
Soil Gas Well WB1
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



Soil Gas Well WB7
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



Soil Gas Well WB15
Fluctuation in Methane, Oxygen, and Carbon Dioxide Percentages over Time
 Springfield Street School Complex
 Providence, Rhode Island



**Soil Gas Monitoring Results
Springfield Street School
Providence, Rhode Island**

Location	Date	CH ₄	O ₂	CO ₂	CO	H ₂ S
EPL1	Apr-00	0.3%	21.9%	0.3%	0	0
	Dec-00	0.0%	20.0%	0.0%	0	0
	Feb-01	0.0%	20.0%	0.2%	0	0
	Jul-01	0.0%	19.0%	1.6%	0	0
	Jun-02	0.0%	19.5%	1.2%	0	0
	Sep-02	0.0%	19.5%	1.2%	0	0
	Dec-02	0.0%	21.0%	0.0%	8	3
	Mar-03	0.0%	20.2%	0.1%	5	1
	Jul-03	0.0%	16.8%	1.9%	3	0
	Nov-03	0.1%	19.4%	0.8%	0	0
	Jan-04	0.0%	20.3%	0.1%	13	5
	May-04	0.0%	21.1%	0.0%	0	0
	Aug-04	0.0%	19.7%	0.7%	0	0
	Sep-04	0.0%	19.0%	3.2%	0	0
EPL4	Apr-00	0.2%	19.1%	3.2%	0	0
	Dec-00	0.0%	18.0%	0.8%	0	0
	Feb-01	0.0%	18.0%	0.9%	0	0
	Jul-01	0.0%	10.8%	9.8%	0	0
	Jun-02	0.0%	12.5%	5.6%	0	0
	Sep-02	0.0%	12.1%	6.6%	0	0
	Dec-02	0.0%	16.6%	3.1%	1	1
	Mar-03	0.0%	16.9%	1.2%	18	1
	Jul-03	0.0%	10.9%	5.0%	3	0
	Nov-03	0.1%	10.4%	5.2%	0	1
	Jan-04	0.0%	19.8%	0.8%	12	5
	May-04	0.0%	21.0%	0.0%	0	0
	Aug-04	0.0%	11.4%	6.3%	0	0
	Sep-04	0.0%	15.6%	2.1%	0	0
MG2	Apr-00	0.0%	18.8%	2.8%	0	0
	Dec-00	0.0%	19.5%	0.5%	0	0
	Feb-01	0.0%	19.5%	0.7%	0	0
	Jul-01	0.0%	16.3%	3.3%	0	0
	Jun-02	0.0%	17.9%	2.0%	0	0
	Sep-02	0.0%	17.6%	3.2%	0	0
	Dec-02	0.0%	20.3%	0.0%	12	5
	Mar-03	0.0%	20.7%	0.1%	27	4
	Jul-03	0.0%	15.7%	2.5%	1	1
	Nov-03	0.0%	15.4%	4.2%	3	0
	Jan-04	0.0%	20.2%	0.1%	4	5
	May-04	0.0%	21.5%	0.0%	2	1
	Aug-04	0.0%	16.6%	2.5%	2	2
	Sep-04	0.0%	20.9%	0.4%	0	0

**Soil Gas Monitoring Results
Springfield Street School
Providence, Rhode Island**

Location	Date	CH ₄	O ₂	CO ₂	CO	H ₂ S
MPL5	Apr-00	0.2%	14.8%	5.8%	0	0
	Aug-00	0.0%	9.4%	8.7%	-	-
	Dec-00	0.0%	15.0%	3.2%	0	0
	Jul-01	0.0%	18.7%	2.0%	0	0
	Jun-02	0.1%	11.9%	6.7%	0	0
	Sep-02	0.0%	7.7%	10.3%	0	0
	Dec-02	0.0%	16.2%	3.8%	12	5
	Mar-03	0.0%	17.6%	1.9%	25	3
	Jul-03	0.0%	7.0%	7.6%	3	1
	Nov-03	0.0%	18.9%	1.1%	0	0
	Jan-04	0.0%	20.8%	0.0%	7	9
	May-04	0.0%	21.1%	0.0%	2	2
	Aug-04	0.0%	6.4%	10.0%	3	0
	Sep-04	0.0%	3.7%	12.2%	1	0
WB1	Sep-99	0.0%	12.5%	6.4%	0	0
	Apr-00	0.2%	17.6%	1.2%	0	0
	Aug-00	0.0%	15.1%	3.8%	-	-
	Dec-00	0.0%	18.0%	2.0%	0	0
	Feb-01	0.0%	18.0%	0.6%	0	0
	Jul-01	0.1%	15.6%	4.2%	0	0
	Jun-02	0.0%	17.7%	2.1%	0	0
	Sep-02	0.0%	16.1%	4.0%	0	0
	Dec-02	0.0%	19.1%	1.2%	11	0
	Mar-03	0.1%	20.7%	0.0%	30	1
	Jul-03	0.0%	17.1%	2.1%	0	0
	Nov-03	0.0%	17.8%	2.3%	0	0
	Jan-04	0.0%	20.2%	0.4%	13	6
	May-04	0.0%	21.1%	0.0%	0	0
Aug-04	0.0%	10.7%	4.0%	1	0	
Sep-04	0.0%	14.2%	5.0%	0	0	
WB7	Sep-99	0.0%	12.9%	3.2%	0	0
	Apr-00	0.1%	21.4%	0.2%	0	0
	Dec-00	0.0%	20.0%	0.2%	0	0
	Feb-01	0.0%	20.0%	0.0%	0	0
	Jul-01	0.0%	20.6%	0.0%	0	0
	Jun-02	0.0%	18.5%	1.1%	0	0
	Sep-02	0.0%	20.8%	0.0%	0	0
	Dec-02	0.0%	20.8%	0.0%	11	5
	Mar-03	0.0%	20.5%	0.0%	15	0
	Jul-03	0.0%	20.4%	0.0%	4	0
	Nov-03	0.0%	20.2%	0.0%	0	0
	Jan-04	0.0%	20.9%	0.0%	9	7
	May-04	0.0%	20.9%	0.0%	0	1
	Aug-04	0.0%	20.4%	0.0%	0	0
Sep-04	0.0%	20.6%	0.0%	0	1	

**Soil Gas Monitoring Results
Springfield Street School
Providence, Rhode Island**

Location	Date	CH ₄	O ₂	CO ₂	CO	H ₂ S
<i>WB15</i>	Jul-01	0.0%	18.2%	2.6%	0	0
	Jun-02	0.0%	19.1%	0.0%	0	0
	Sep-02	0.0%	17.8%	2.8%	1	0
	Dec-02	0.0%	20.6%	0.0%	10	5
	Mar-03	0.0%	20.4%	0.1%	24	1
	Jul-03	0.0%	18.9%	1.3%	7	1
	Nov-03	0.0%	14.4%	4.8%	1	0
	Jan-04	0.0%	20.7%	0.0%	10	2
	May-04	0.0%	20.9%	0.0%	0	0
	Aug-04	0.0%	16.3%	2.7%	1	0
	Sep-04	0.0%	18.3%	3.3%	0	0