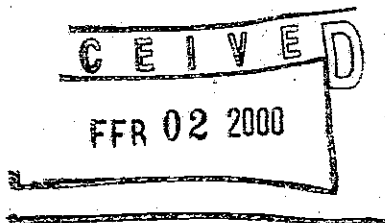


**emcon** Alaska, Inc.

4701 Business Park Boulevard • Suite 36 • Anchorage, Alaska 99503-7166 • (907) 562-3452 • Fax (907) 563-2814



January 31, 2000  
Project 793842.08G00000  
Serial Letter No. D0008-037-

Mr. Lynden Belin  
Southern Area Office  
U.S. Army Engineer District, Alaska  
P.O. Box 898  
Anchorage, Alaska 99506-0898

Re: Vapor Extraction System First Operational Status Report Under Task 8G, Building  
986 Remedial Action, Fort Richardson, Alaska

Dear Mr. Belin:

EMCON Alaska, Inc. (EMCON), has been retained by U.S. Army Corps of Engineers, Alaska District (USACE) under Delivery Order 008, Contract No. DACA85-94-D-0016, to perform operation and monitoring of the vapor extraction (VE) system at Building 986, Fort Richardson, Alaska. Under the awarded optional task 8G, EMCON is performing operation and maintenance (O&M) and quarterly respiration testing. Throughout VE system operation, EMCON has conducted periodic monitoring and sampling to assess VE system performance. This letter report presents a summary of VE system performance from October 1999, through January 2000.

## OPERATIONAL MONITORING

Since installation of the passive bioventing system after one year of VE system operation EMCON has performed monthly checks on the system operation. Currently the system is extracting soil gas from only VE well No. 3. This well is located in the former dry well location. This location is surrounded by the 14 passive bioventing wells. See Figure 1.

The system flow rates are remaining stable because only one well is currently open. No adjustments to the system are being made.

## RESPIRATION SHUT DOWN TESTING

On October 18, 1999 the initial respiration testing was performed for a period of two days. Prior to shutting off the blower for the respiration test, the VE system was configured to extract air from VE well No. 3, an initial effluent sample was collected, and initial soil vapor readings were collected from the three monitoring points. Readings were collected from each of the monitoring points at half-hour intervals for the first 4 hours of shut down on October 18, 1999. On October 19, 1999 readings were collected every hour except for the period in mid day when there was a local power outage. Once the readings appeared to stabilize the blower was turned back on.

The second respiration testing was conducted from January 17, to January 24, 2000. On January 17<sup>th</sup> the blower was shut off and readings were collected from the three monitoring points every hour for 6 hours. From January 18 to January 21 one reading was collected each day from the three monitoring points. The final readings were collected on January 24. No readings were collected over the weekend. After the last set of readings were collected from the monitoring points on January 24, 2000, the blower was turned back on. A sample of the effluent was collected for comparison to the initial effluent sample collected on October 19, 1999. The results of both of these samples will be reported in the second quarterly status report.

## ANALYTICAL SAMPLING PROGRAM

### Effluent Sampling

Prior to the initial respiration test conducted after the installation of the passive bioventing wells, an effluent sample was collected from the VE system exhaust stack to estimate hydrocarbon-mass removal rates for the single well configuration. The sample was collected from the exhaust stack using laboratory-prepared, 1-liter Silco Summa<sup>®</sup> canisters. The sample was sent to Performance Analytical, Inc., of Simi Valley, California, for analysis. The effluent sample was analyzed for the following parameters:

- Total petroleum hydrocarbons as gasoline (TPH-G) by U.S. Environmental Protection Agency (USEPA) Method TO-3

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by California Air Resources Board (CARB) Method 410
- Hydrogen sulfide ( $H_2S$ ) by USEPA Method 16
- Methane ( $CH_4$ ), carbon dioxide ( $CO_2$ ), oxygen ( $O_2$ ), and nitrogen ( $N_2$ ) by USEPA Method 25C

## FINDINGS

The results of the two respiration tests are presented in the attached charts. The readings for monitoring point MP1 for both tests show that oxygen is being utilized at a linear rate and that carbon dioxide (the byproduct of biological activity) is increasing at a non linear rate at both the 10 foot and 20 foot depth zones at that location. MP1 is located near the former location of the dry well. These results indicate that biological activity is occurring in the area around MP1.

The readings from MP2 show that oxygen utilization and carbon dioxide concentrations were non-linear in October 1999 at 10 feet but were linear at 20 feet. The results of the January 2000 monitoring at this location were similar. Due to the fluctuations seen in both oxygen and carbon dioxide concentrations for the 10 foot depth at this location, it can be surmised that biological activity is sporadic due to the lack of nutrients or food (i.e. petroleum) for the micro organisms. There appears to be biological activity at the 20-foot depth at the location.

MP3 is located away from the main area of contamination at the former dry well. The concentrations of oxygen and carbon dioxide fluctuated significantly during both respiration tests. It appears that biological activity is minimal at this location. This location can be used to provide possible background information on the subsurface biological activity in areas where there is no significant amount of contamination.

## CONCLUSIONS

Review of monitoring and analytical data indicates that the VE system is remediating subsurface soil near the site of the dry well formerly located at Building 986. Observations to date indicate that remediation is progressing by two processes: physical removal of hydrocarbon vapors and, to a lesser degree, bioremediation through the utilization of oxygen in the soil gas.

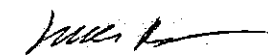
Mr. Lynden Belin  
January 31, 2000  
Page 4

Project 793842.08G00000

Evidence of physical treatment and bioremediation is obtained through sampling and analysis of the extracted soil gas. Analysis of the VE system effluent for petroleum hydrocarbons indicates that the VE system is successfully extracting contaminants. The presence of slightly elevated CO<sub>2</sub> concentrations in soil gas analyzed from the VE system exhaust stack may be an indication of hydrocarbon biodegradation in site soils. In addition, atmospheric oxygen concentrations in the soil gas indicate that oxygen is not currently limiting hydrocarbon biodegradation.

The data collected from the three soil gas monitoring points indicate that biodegradation is occurring in the soils at the site where contamination is found.

Sincerely,  
**EMCON Alaska, Inc.**



Lance Raymore,  
Project Manager

Attachments: Limitations  
Figure 1 Site Layout  
Monitoring Point Respiration Testing Charts

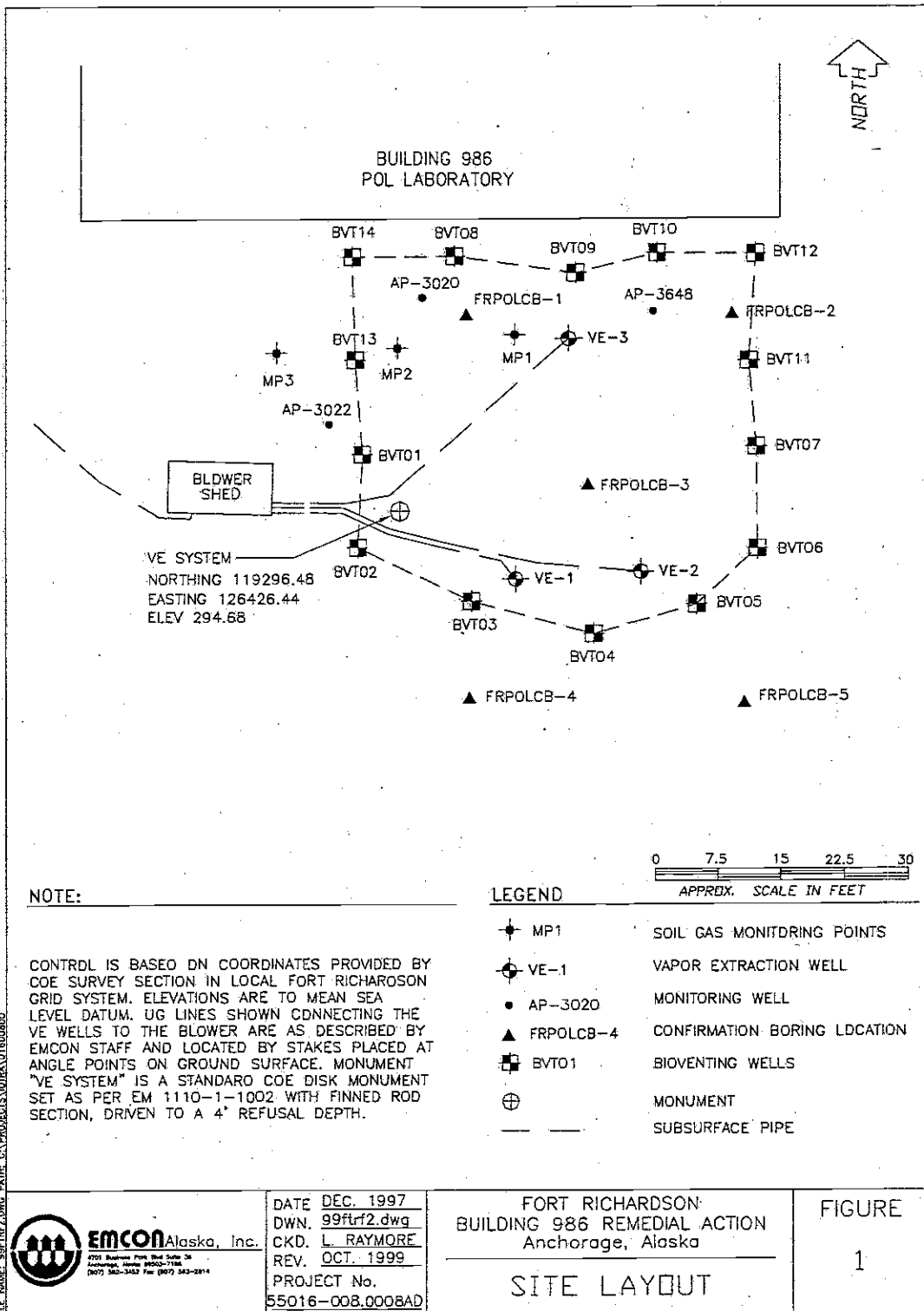
cc: file

## LIMITATIONS

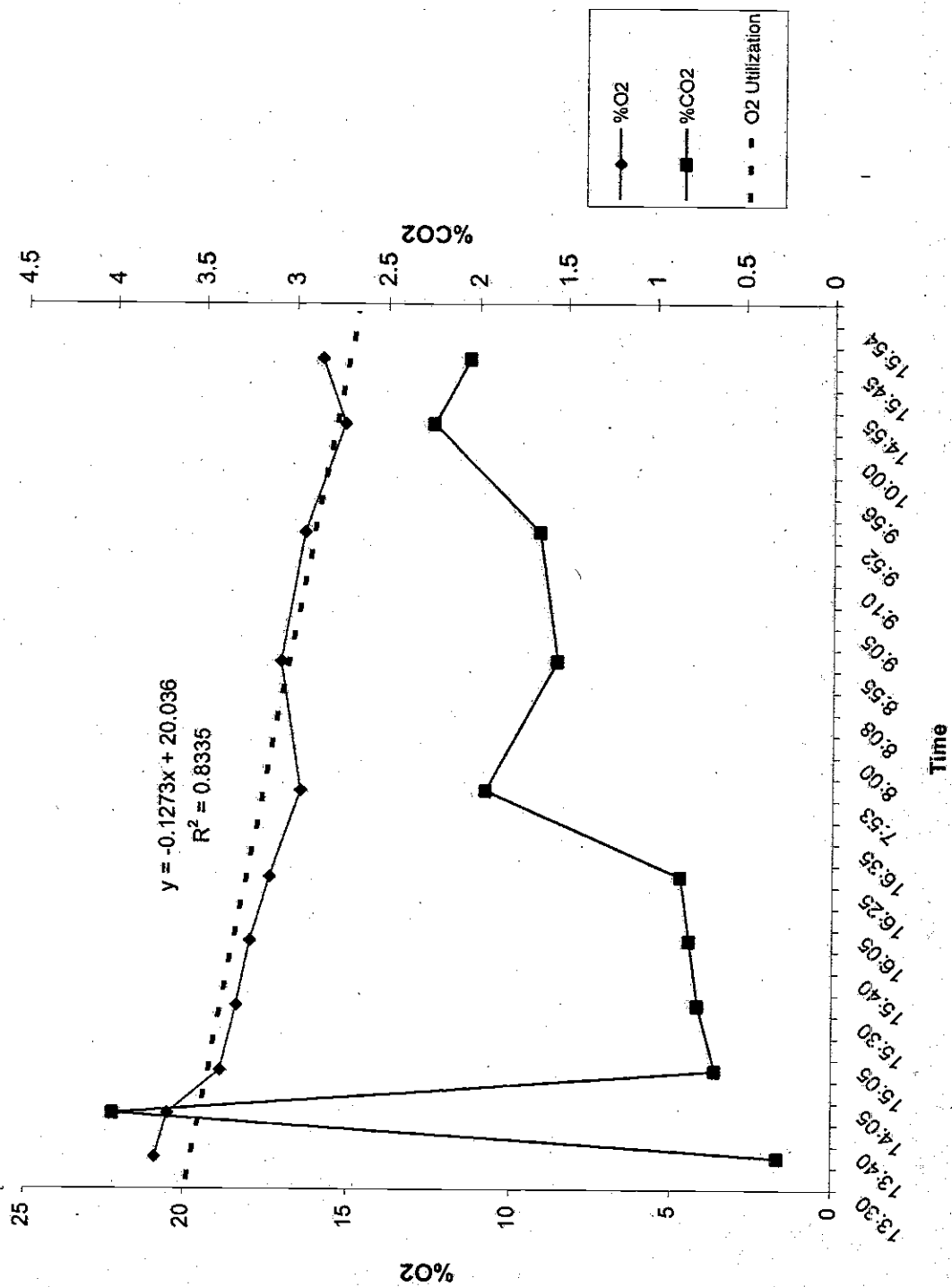
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The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

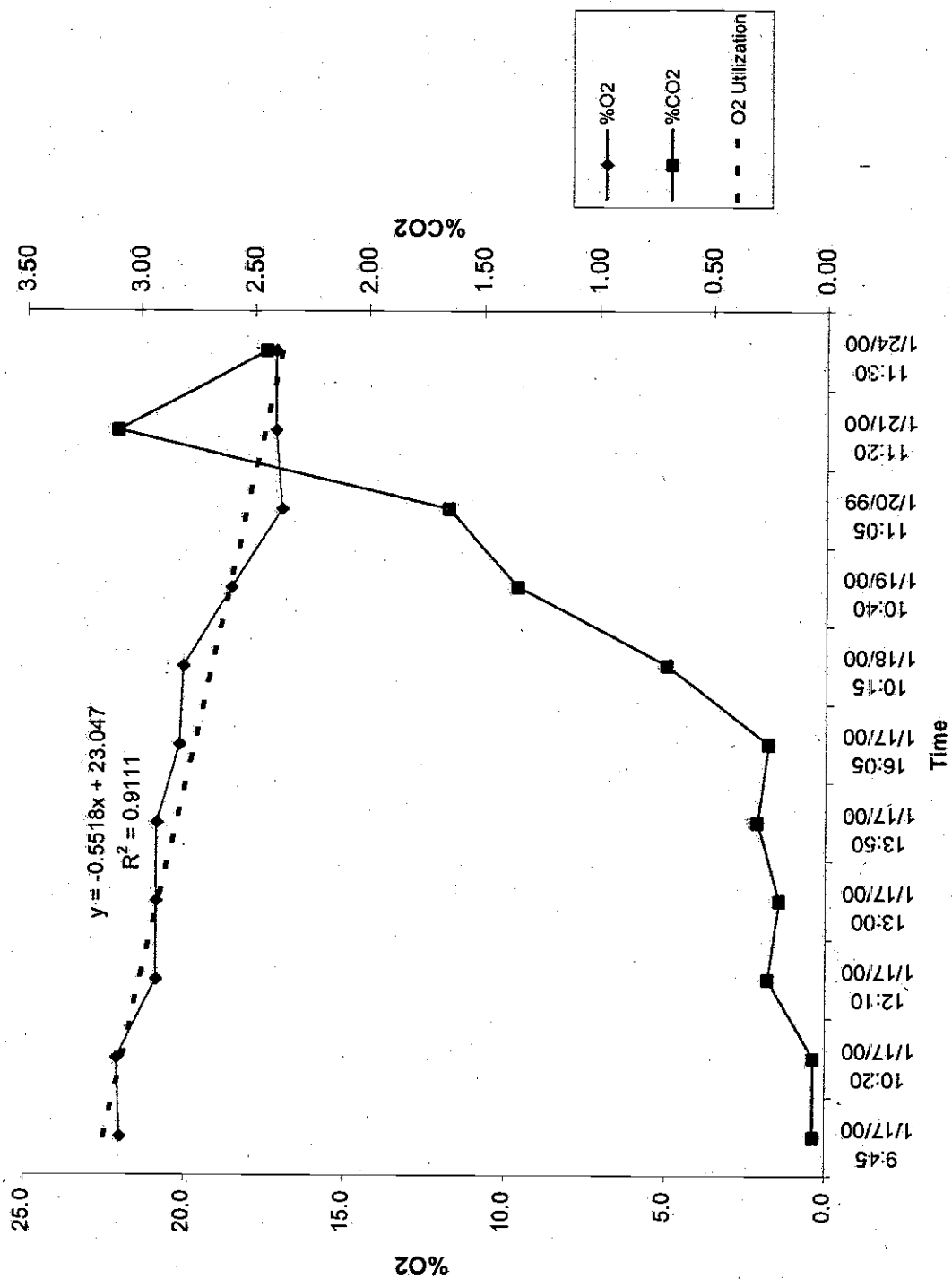
Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.



October 1999  
MP1 - 10 feet

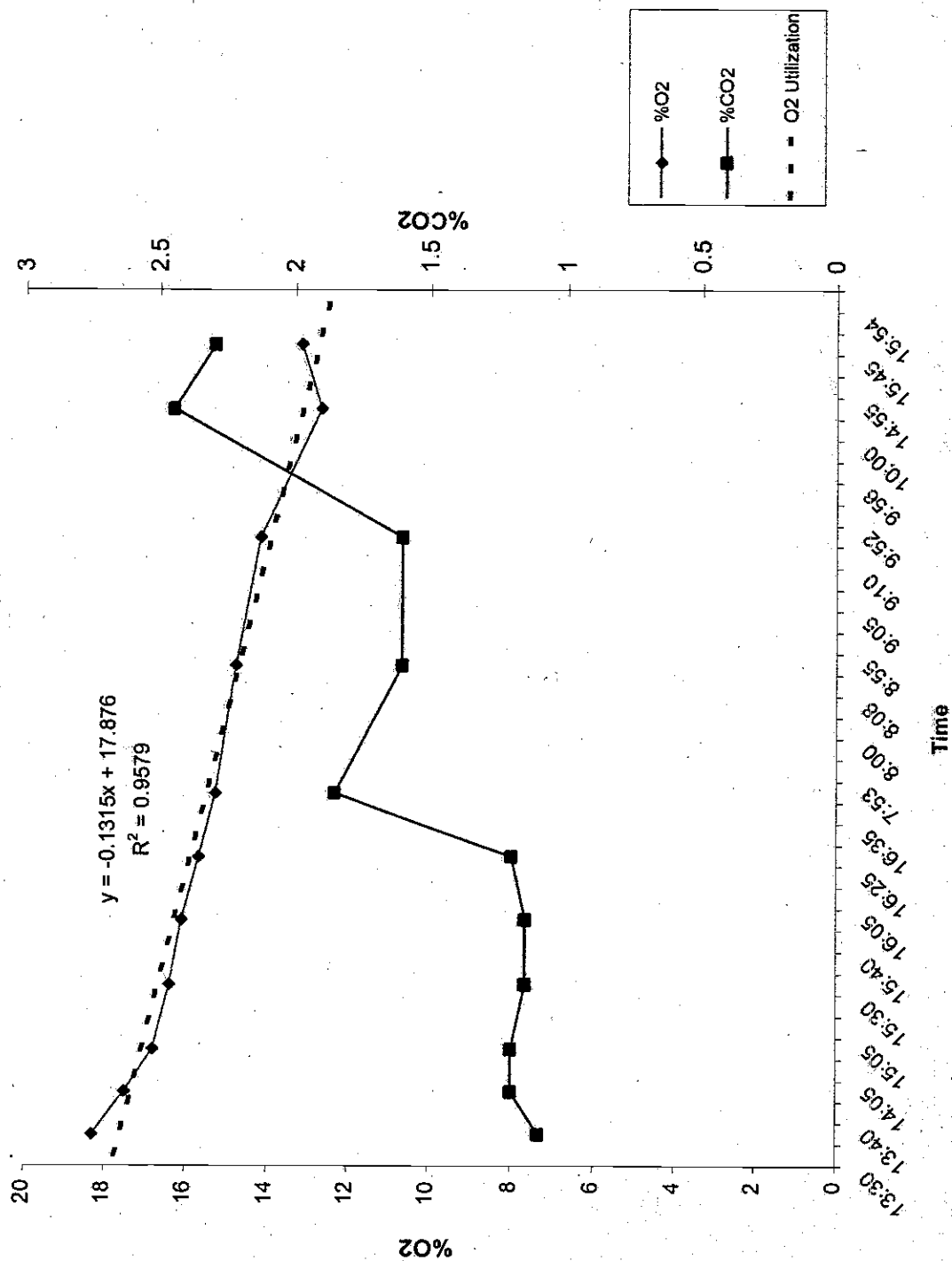


January 2000  
MP1 - 10 feet

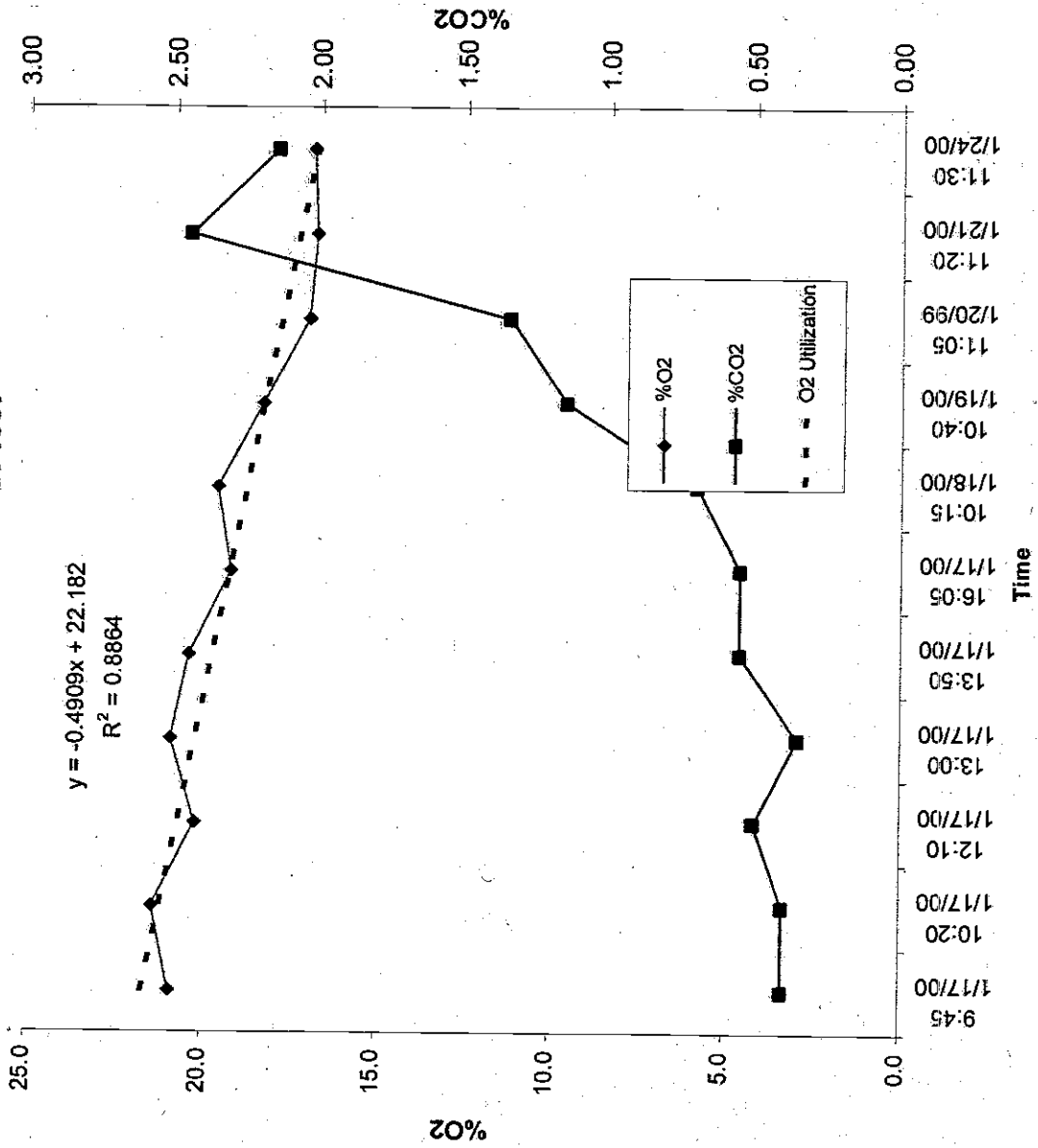




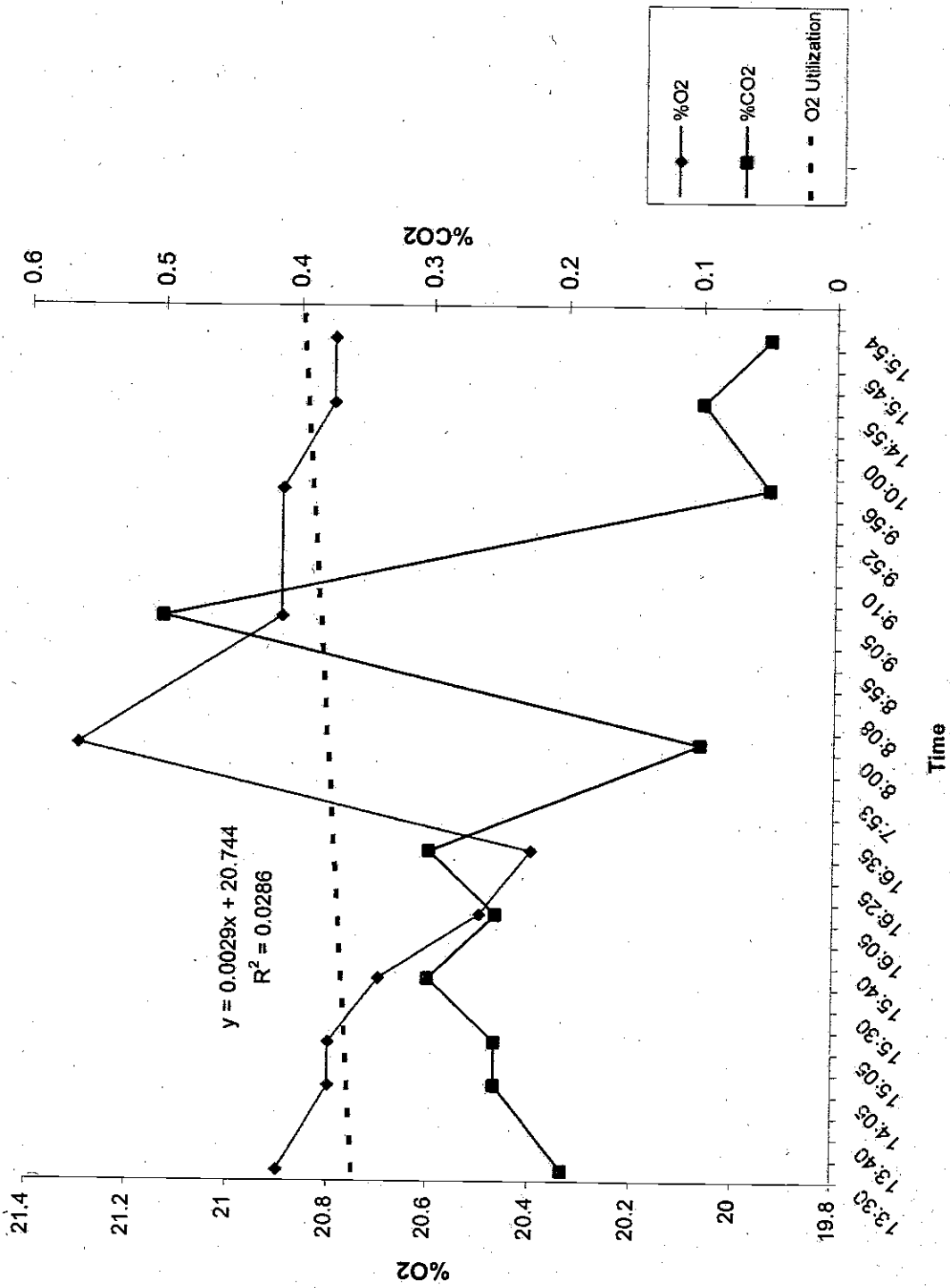
October 1999  
MP1 - 20 feet

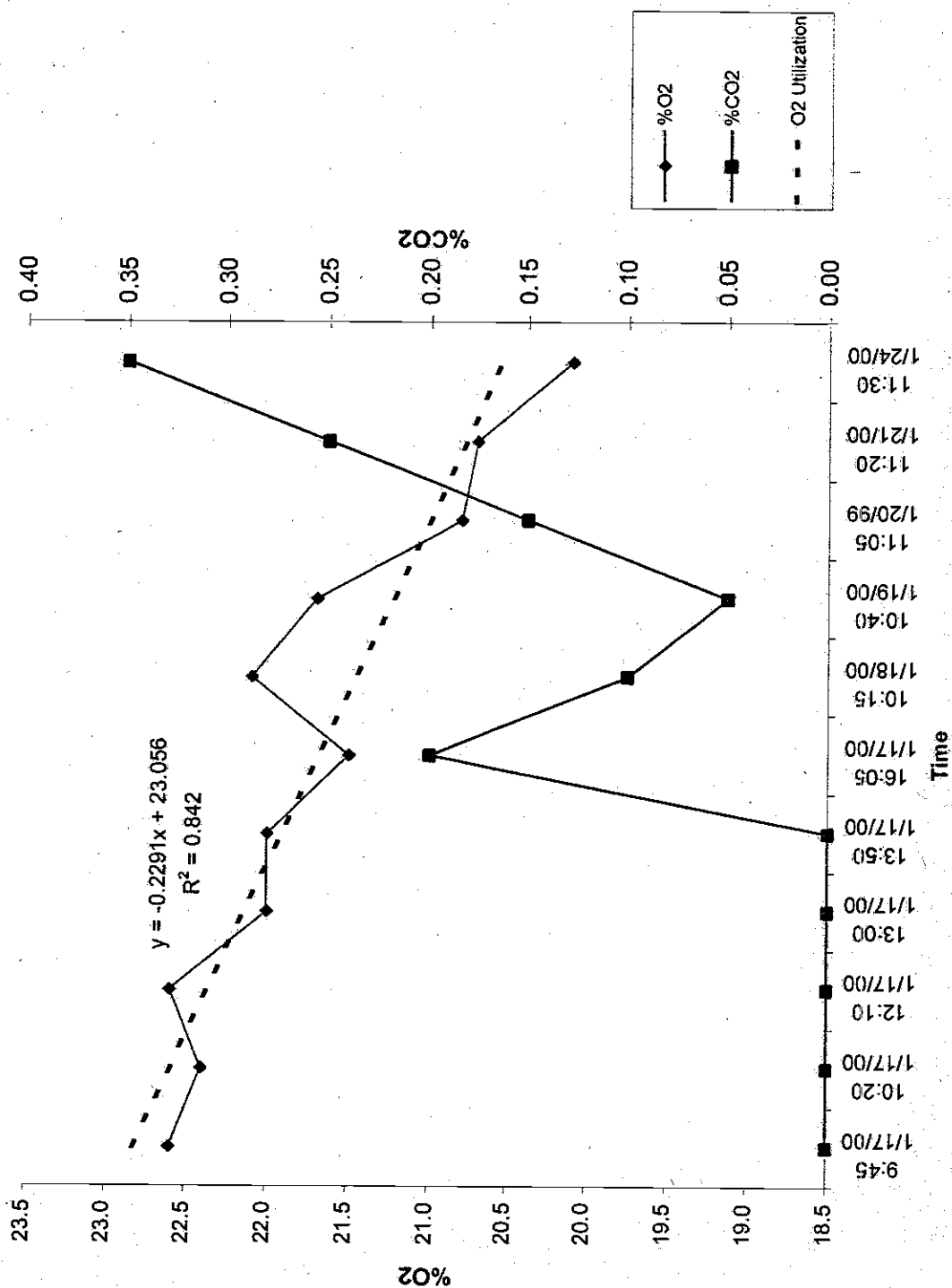


January 2000  
MP1 - 20 feet

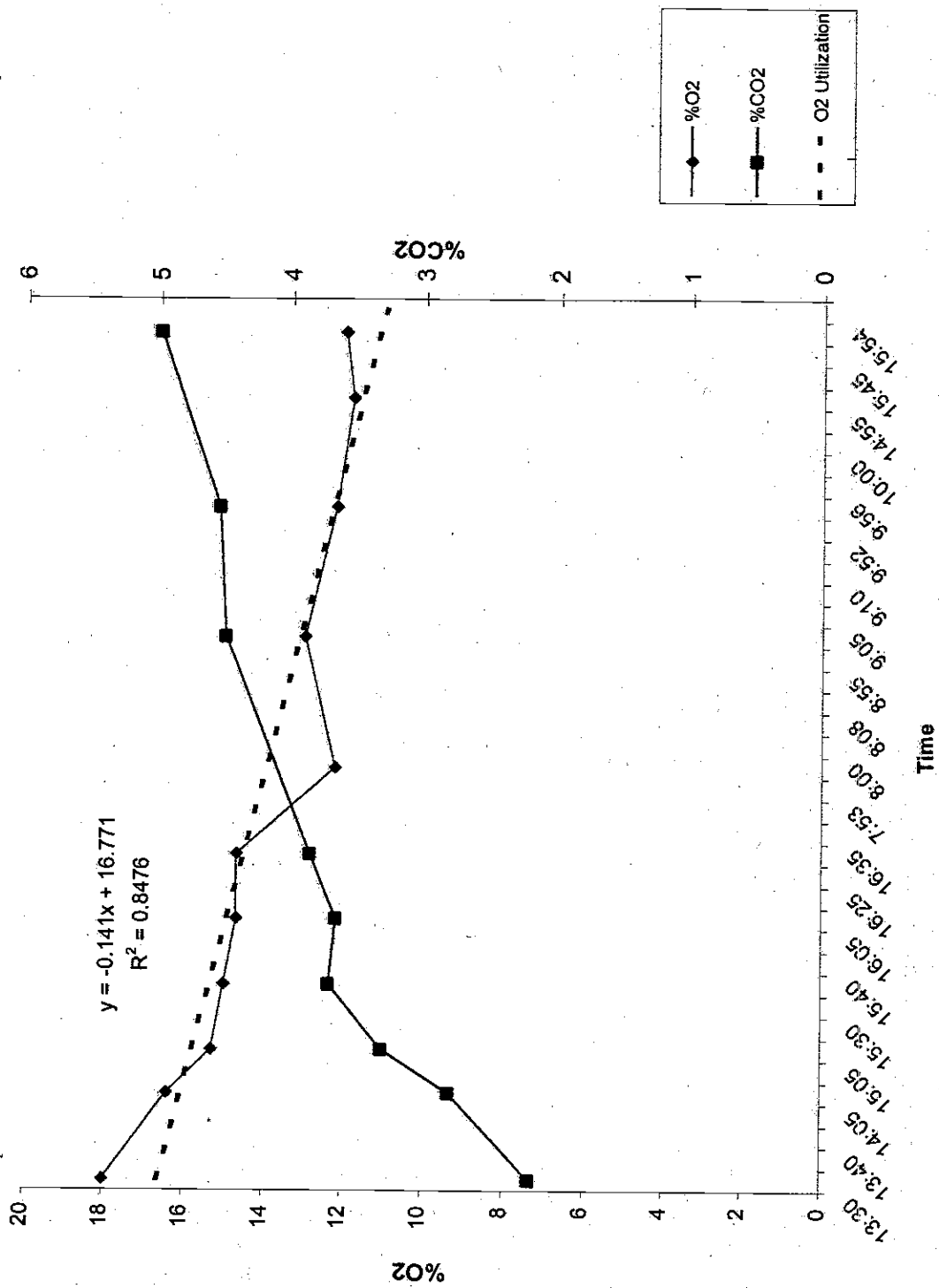


October 1999  
MP2 - 10 feet

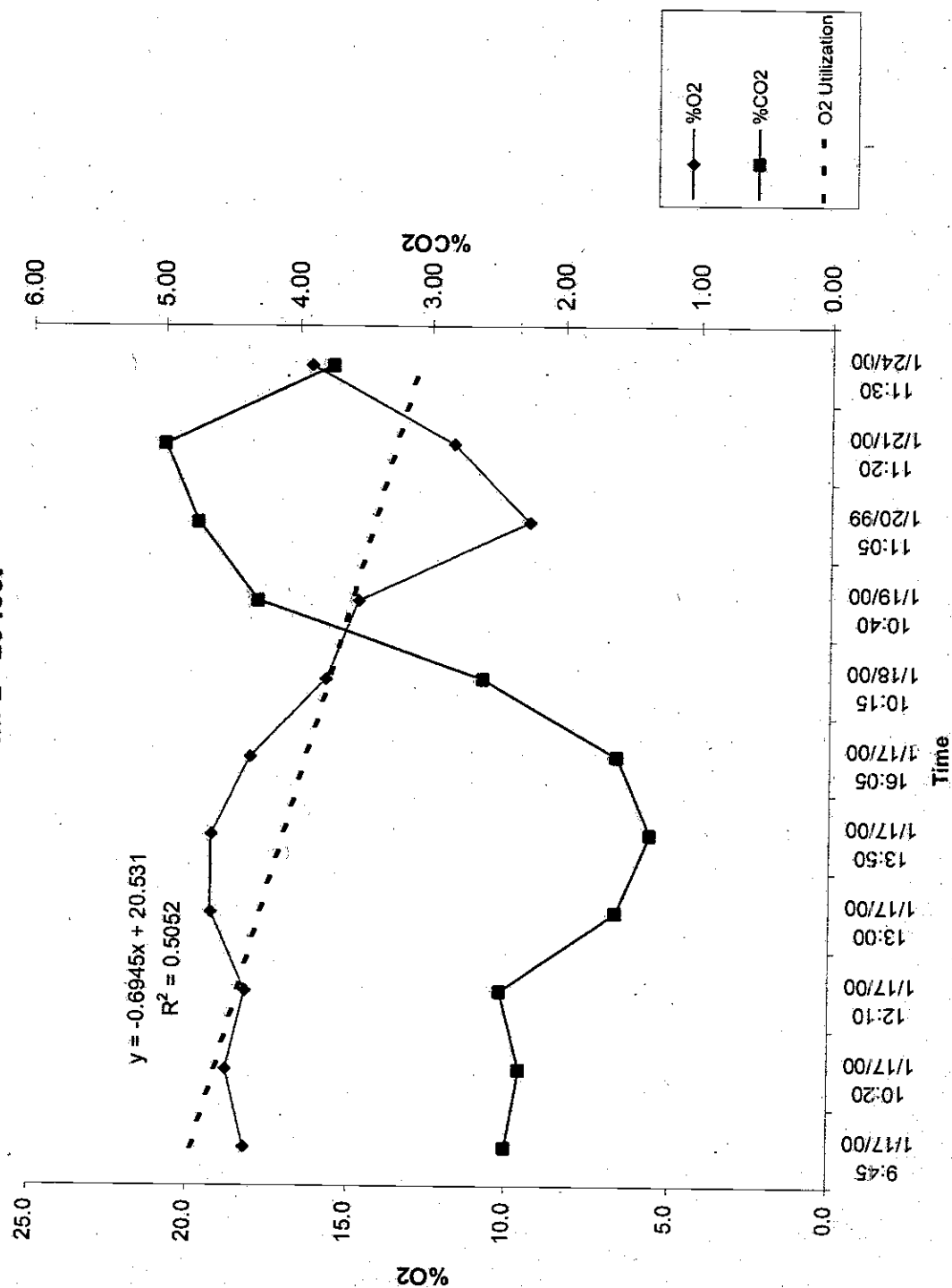




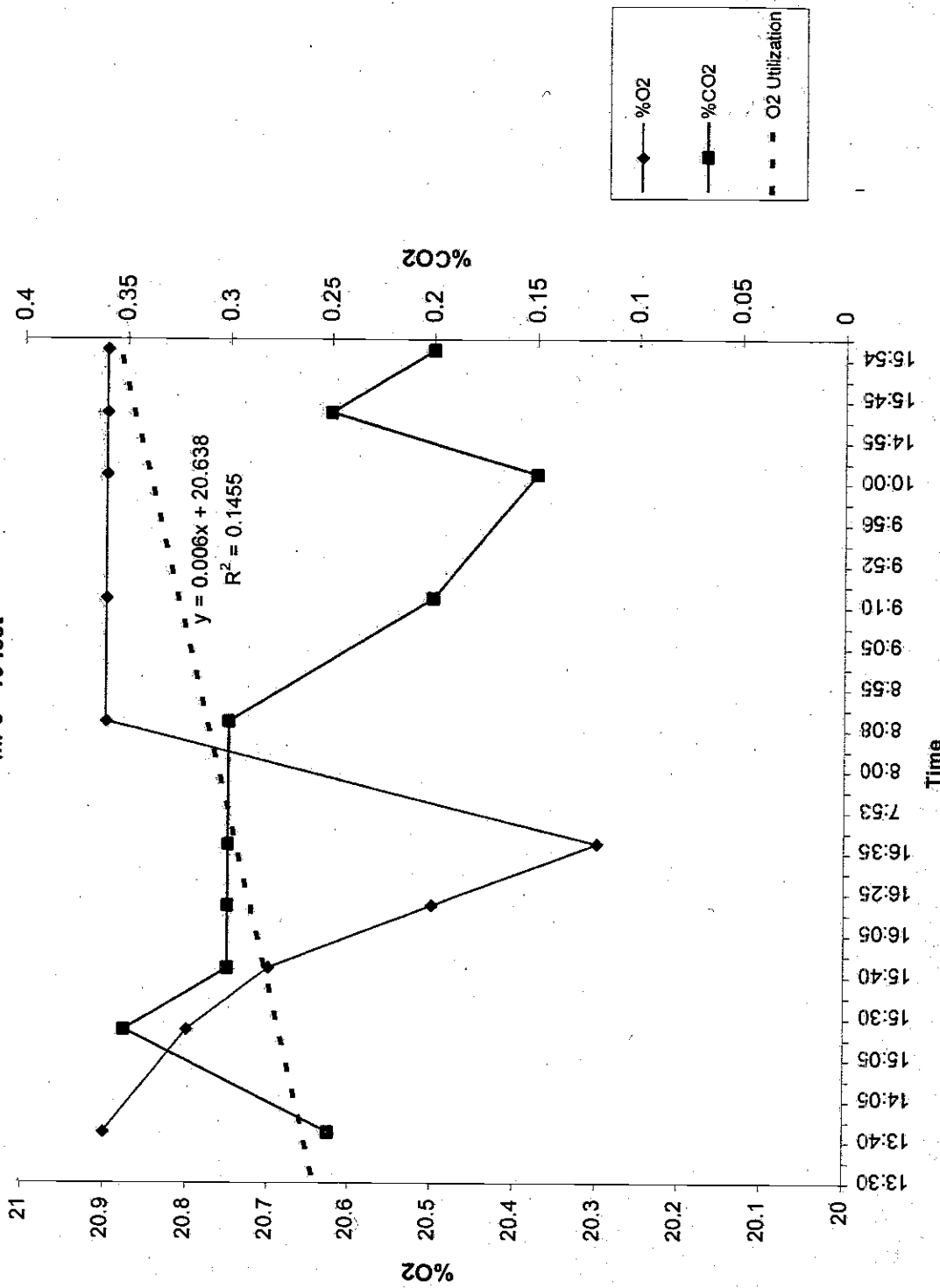
October 1999  
MP2 - 20 feet



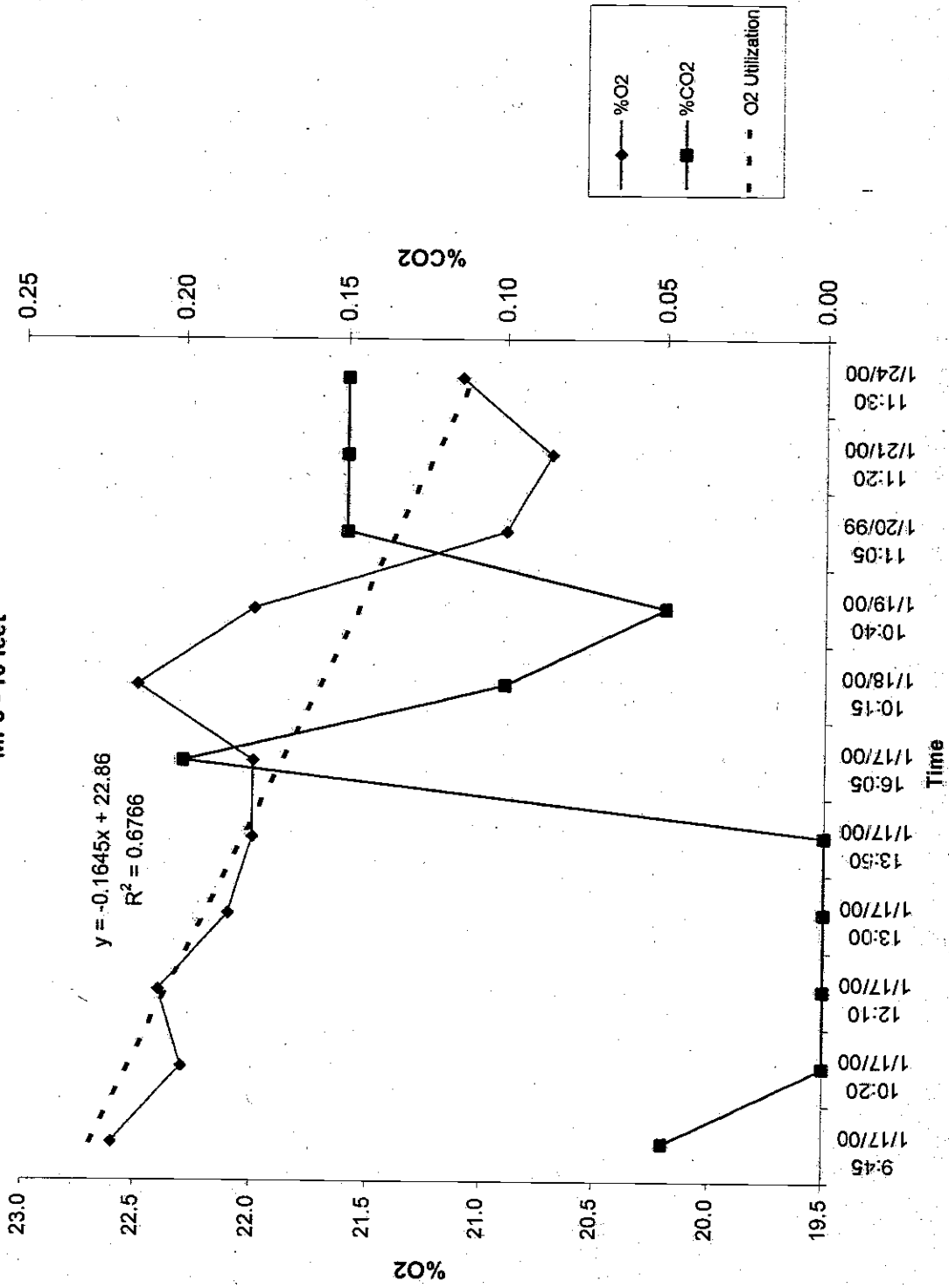
January 2000  
MP2 - 20 feet



October 1999  
MP3 - 10 feet

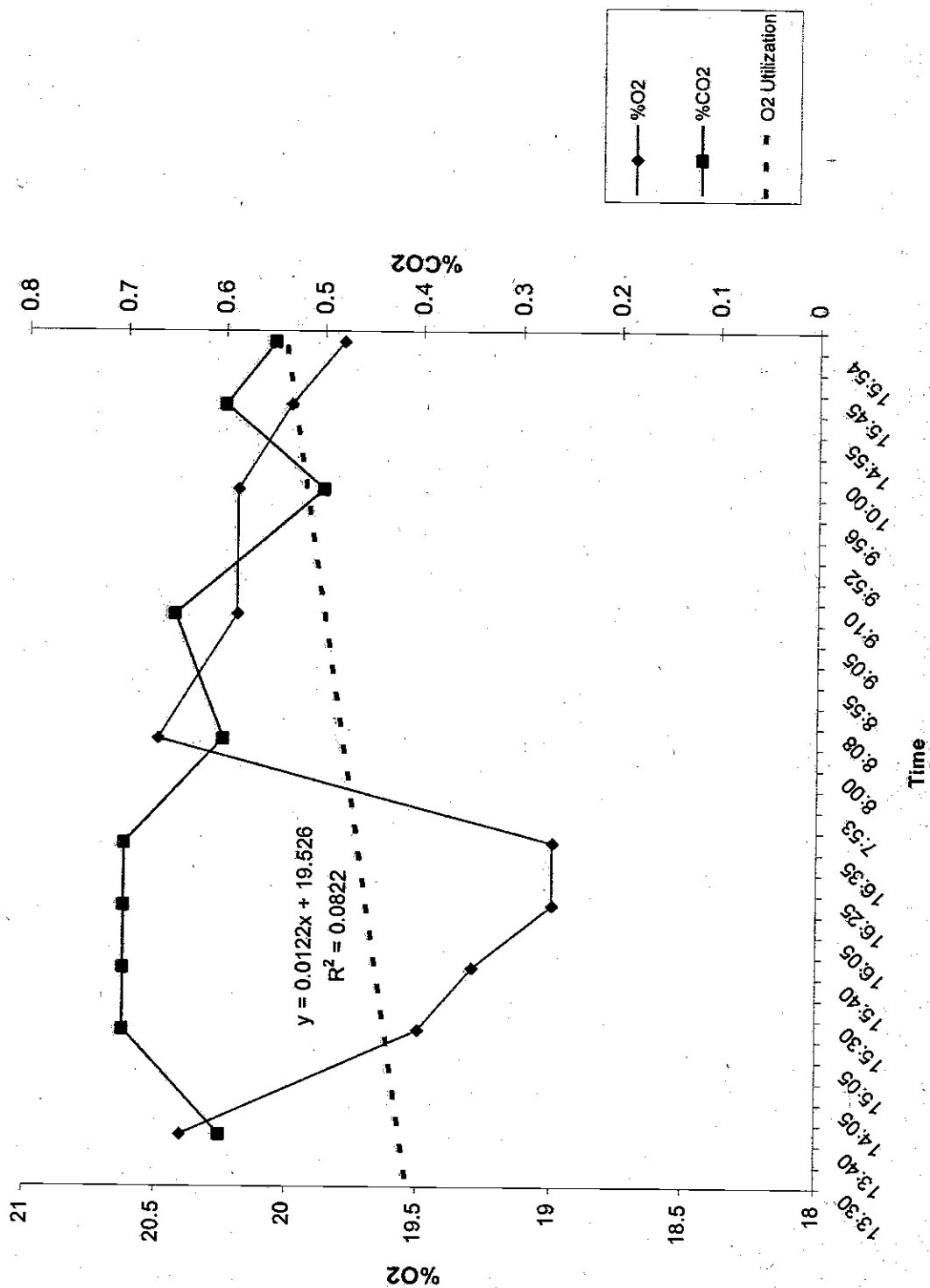


January 2000  
MP3 - 10 feet





October 1999  
MP3 - 20 feet



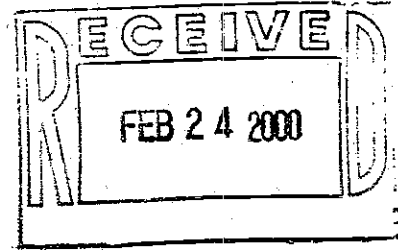


**emcon** Alaska, Inc.

4701 Business Park Boulevard • Suite 36 • Anchorage, Alaska 99503-7166 • (907) 562-3452 • Fax (907) 563-2814

February 21, 2000  
Project 793842.08G00000  
Serial Letter No. DO008-038

Mr. Lynden Belin  
Southern Area Office  
U.S. Army Engineer District, Alaska  
P.O. Box 898  
Anchorage, Alaska 99506-0898



Re: Addendum to Serial Letter No. DO008-037, Building 986 Remedial Action, Fort Richardson, Alaska.

Dear Mr. Belin:

EMCON Alaska, Inc. (EMCON), has been retained by U.S. Army Corps of Engineers, Alaska District (USACE) under Delivery Order 008, Contract No. DACA85-94-D-0016, to perform operation and monitoring of the vapor extraction (VE) system at Building 986, Fort Richardson, Alaska. Under the awarded optional task 8G, EMCON is performing operation and maintenance (O&M) and quarterly respiration testing. Throughout VE system operation, EMCON has conducted periodic monitoring and sampling to assess VE system performance. This serial letter provides the results of the two effluent samples collected during the first quarter of operation of the combined VE and passive bioventing system under Task 8G.

## EFFLUENT SAMPLING

Since startup of the combined VE and passive bioventing system, on October 19, 1999, EMCON has performed two shutdown respiration tests. The shutdown respiration tests included the measurement of soil gas composition in the soil vapor probes and the collection of VE effluent samples.

On October 19, 1999 an effluent sample was collected from the exhaust stack of the VE system at Building 986. The timing of the sample occurred with the change in configuration of the system from drawing soil vapor from all three VE wells to drawing soil vapor only from VE well 3. VE well 3 is located in the approximate center of the former location of the dry well. The effluent sample was collected 5 minutes after the change in configuration. This sample provides a reasonable approximation of the soil



vapor composition resulting from the interaction between the reconfigured VE system and the passive bioventing system installed around the perimeter of the contaminated area.

On January 24, 2000 an effluent sample was collected from the exhaust stack after the second respiration shut down monitoring event was conducted over the previous 7 days. This sample was collected from the exhaust stack 7 minutes after the blower for the VE system was restarted. This sample will provides data showing active biodegradation of contaminants at the site in the vicinity of VE well 3.

## ANALYTICAL RESULTS

Two effluent samples were collected during the first quarter of VE system operation under task 8G. Both effluent samples were collected from the exhaust stack using laboratory-prepared, 1-liter Silco Summa<sup>®</sup> canisters. The samples were sent to Performance Analytical, Inc., of Simi Valley, California, for analysis. The effluent samples were analyzed for the following parameters:

- Total petroleum hydrocarbons as gasoline (TPH-G) by U.S. Environmental Protection Agency (USEPA) Method TO-3
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by California Air Resources Board (CARB) Method 410
- Hydrogen sulfide (H<sub>2</sub>S) by USEPA Method 16
- Methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), and nitrogen (N<sub>2</sub>) by USEPA Method 25C

The results from the sample collected on October 18, 1999 (99POL020AG) show there to be depleted O<sub>2</sub> and increased CO<sub>2</sub> compared to the sample collected on September 14, 1999. The September sample was collected while the VE system was still configured to extract soil vapors from all three VE wells. The concentrations of TPH-G also increased in the October sample. Benzene, toluene, ethylbenzene, and total xylenes were not detected above reporting limits in the October sample.

The results from the sample collected on January 24, 2000 (00POL020AG) show there to still be depleted O<sub>2</sub> and increased CO<sub>2</sub>. This was expected since the system had been through a respiration-monitoring period just prior to sample collection. The TPH-G concentration decreased slightly compared to the October sample.

Mr. Lynden Belin  
February 21, 2000  
Page 3

Project 793842.08G00000

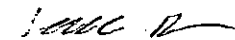
The attached table provides a comparison of the last three samples collected from the effluent of the VE system.

## CONCLUSIONS AND RECOMMENDATIONS

The reduction in THP-G concentrations in the VE system effluent may be the result of either the VE system operations or biodegradation in the soils aided by the passive bioventing system installed in October 1999.

Continued operation of the combined reconfigured VE system and the passive bioventing is recommended. An effluent sample should be collected prior to the next shut down test so that total removed hydrocarbons can be calculated.

Sincerely,  
EMCON Alaska, Inc.



Lance Raymore,  
Project Manager

Attachments: Limitations  
Analytical Results Table  
Laboratory Analytical Reports

cc: file

## LIMITATIONS

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The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

**Task 8G**  
**VE System Removal Rate Calculations**  
**Building 986 Remedial Action**

| Sample Number  | Date     | Days | TPH as Gasoline (mg/m <sup>3</sup> ) | Benzene (mg/m <sup>3</sup> ) | Toluene (mg/m <sup>3</sup> ) | Ethylbenzene (mg/m <sup>3</sup> ) | Total Xylenes (mg/m <sup>3</sup> ) | Total BTEX (mg/m <sup>3</sup> ) | Average Flow Rate (cfm) | Estimated Removal Rate (lb/day) |            |
|--|----------|------|--------------------------------------|------------------------------|------------------------------|-----------------------------------|------------------------------------|---------------------------------|-------------------------|---------------------------------|------------|
|  |          |      |                                      |                              |                              |                                   |                                    |                                 |                         | TPH as Gasoline                 | Total BTEX |
| 99POL019AG   | 9/14/99  |      | 39                                   | 0.00                         | 1.10                         | 0.00                              | 0.00                               | 1.10                            | 66.0                    | 0.23                            | 0.006      |
| 99POL020AG   | 10/18/99 | 1    | 94                                   | 0.00                         | 0.00                         | 0.00                              | 0.00                               | 0.00                            | 65.0 <sup>a</sup>       | 0.55                            | 0.000      |
| 00POL020AG   | 1/24/00  | 98   | 76                                   | 0.00                         | 0.00                         | 0.00                              | 0.00                               | 0.00                            | 65.0                    | 0.44                            | 0.000      |
| MRL <sup>b</sup>   | --       |      | 18.0                                 | 0.16                         | 0.19                         | 0.22                              | 0.22                               |                                 |                         |                                 |            |
| MRL - method reporting limit   |          |      |                                      |                              |                              |                                   |                                    |                                 |                         |                                 |            |
| <sup>a</sup> - flow gauge reading is constant since the gauge is maximized at 65 scfm  |          |      |                                      |                              |                              |                                   |                                    |                                 |                         |                                 |            |
| <sup>b</sup> - MRL is reported only for the last sample collected. MRLs for previous samples are reported on earlier tables or in attached analytical results. |          |      |                                      |                              |                              |                                   |                                    |                                 |                         |                                 |            |
| mg/m <sup>3</sup> - Milligrams per cubic meter   |          |      |                                      |                              |                              |                                   |                                    |                                 |                         |                                 |            |



## Performance Analytical Inc.

Air Quality Laboratory  
A Division of Columbia Analytical Services, Inc.  
An Employee Owned Company

### LABORATORY REPORT

|  |                                    |                 |           |
|--|------------------------------------|-----------------|-----------|
| Client:  | EMCON ALASKA, INC.                 | Date of Report: | 11/03/99  |
| Address:   | 4701 Business Park Blvd., Suite 36 | Date Received:  | 10/20/99  |
|  | Anchorage, AK 99503                | PAI Project No: | P9902091  |
| Contact:   | Mr. Lance Raymore                  | Purchase Order: | 126878 OP |
| Client Project ID: Ft. Rich Pol Lab #793842.08600000 |                                    |                 |           |

---

One (1) Silco Canister labeled: "99POL020AG"

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The sample was received at the laboratory under chain of custody on October 20, 1999. The sample was received intact. The dates of analyses are indicated on the attached data sheets.

#### Hydrogen Sulfide Analysis

The sample was analyzed for Hydrogen sulfide using a gas chromatograph equipped with a sulfur chemiluminescence detector.

#### Methane Analysis

The sample was analyzed for Methane according to EPA Method 25C. The analyses were performed by gas chromatography using flame ionization detection/total combustion analysis.

#### Fixed Gases Analysis

The sample was also analyzed for fixed gases (Oxygen/Argon, Nitrogen and Carbon dioxide) using a Hewlett Packard Model 5890 gas chromatograph equipped with a thermal conductivity detector (TCD).

Reviewed and Approved:

David Iwig  
Analytical Chemist

Reviewed and Approved:

John Yokoyama  
Senior Chemist



## Performance Analytical Inc.

Air Quality Laboratory

A Division of Columbia Analytical Services, Inc.

An Employee Owned Company

### Total Petroleum Hydrocarbons as Gasoline Analysis

The sample was also analyzed for total petroleum hydrocarbons as gasoline using a gas chromatograph equipped with a flame ionization detector.

### BTEX Analysis

The sample was also analyzed for Benzene, Toluene, Ethylbenzene and total Xylenes according to modified CARB Method 410 using a gas chromatograph equipped with a photoionization detector.

The results of analyses are given on the attached data summary sheets.





## Performance Analytical Inc.

Air Quality Laboratory  
A Division of Columbia Analytical Services, Inc.  
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### RESULTS OF ANALYSIS

PAGE 1 OF 1

Client: Emcon Alaska, Inc.

Client Project ID: Ft. Rich POL Lab/793842.086-00000

PAI Project ID: P9902091

Test Code: GC/SCD for Sulfur  
Instrument ID: HP 5890A/SCD #5  
Analyst: David Iwig  
Matrix: Silco Canister(s)

Date Sampled: 10/18/99  
Date Received: 10/20/99  
Date Analyzed: 10/20/99  
Volume(s) Analyzed: 1.0 ml

| Client Sample ID | PAI Sample ID   | D.F. | Hydrogen Sulfide                   |  |               |                           |
|------------------|-----------------|------|------------------------------------|--|---------------|---------------------------|
|                  |                 |      | Result<br>$\mu\text{g}/\text{m}^3$ | Reporting<br>Limit<br>$\mu\text{g}/\text{m}^3$ | Result<br>ppb | Reporting<br>Limit<br>ppb |
| 99POL020AG       | P9902091-001    | 1.26 | ND                                 | 2.80   | ND            | 2.00                      |
| 99POL020AG       | P9902091-001DUP | 1.26 | ND                                 | 2.80   | ND            | 2.00                      |
| Method Blank     | P991020-MB      | 1.00 | ND                                 | 2.80   | ND            | 2.00                      |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Verified By: RG

Date: 11/2/99



## Performance Analytical Inc.

Air Quality Laboratory

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An Employee Owned Company

### RESULTS OF METHANE ANALYSIS

PAGE 1 OF 1

**Client:** Emcon Alaska, Inc.

**Client Project ID:** Ft. Rich POL Lab/793842.086-00000

**PAI Project ID:** P9902091

**Test Code:** EPA Method 25C

**Instrument ID:** HP5890A/FID/TCA

**Analyst:** Madeleine Khoubesserian

**Matrix:** Silco Canister(s)

**Date Sampled:** 10/18/99

**Date Received:** 10/20/99

**Date Analyzed:** 10/20/99

**Volume(s) Analyzed:** 0.50 ml

| Client Sample ID | PAI Sample ID | D.F. | Methane                   |                 |
|------------------|---------------|------|---------------------------|-----------------|
|                  |               |      | Concentration in ppm, v/v |                 |
|                  |               |      | Result                    | Reporting Limit |
| 99POL020AG       | P9902091-001  | 1.26 | 4.0                       | 0.50            |
| Method Blank     | P991020-MB    | 1.00 | ND                        | 0.50            |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected



# Performance Analytical Inc.

Air Quality Laboratory  
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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : Emcon Alaska, Inc.

Client Sample ID : 99POL020AG

PAI Sample ID : P9902091-001

Test Code : GC/TCD

Instrument : HP5890/TCD #1

Analyst : Madeleine Khoubesserian

Matrix : Silco Canister

Date Sampled : 10/18/99

Date Received : 10/20/99

Date Analyzed : 10/20/99

Volume(s) Analyzed : 0.10 ml

Pi 1 = 0.3 Pf 1 = 4.2

D.F. = 1.26

| CAS #     | COMPOUND       | RESULT<br>(%, v/v) | REPORTING<br>LIMIT<br>(%, v/v) |
|-----------|----------------|--------------------|--------------------------------|
| 7782-44-7 | Oxygen +       |                    |                                |
| 7440-37-1 | Argon *        | 18.9               | 0.100                          |
| 7727-37-9 | Nitrogen       | 80.3               | 0.100                          |
| 124-38-9  | Carbon Dioxide | 0.764              | 0.100                          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

\* = Coeluting Compounds: Assumes A Ratio Of 22.53:1 By Volume

Verified By: RG Date: 11/2/99

Page No.:



# Performance Analytical Inc.

Air Quality Laboratory  
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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : Emcon Alaska, Inc.

Client Sample ID : 99POL020AG

PAI Sample ID : P9902091-001DUP

Test Code : GC/TCD

Instrument : HP5890/TCD #1

Analyst : Madeleine Khoubessarian

Matrix : Silco Canister

Date Sampled : 10/18/99

Date Received : 10/20/99

Date Analyzed : 10/20/99

Volume(s) Analyzed : 0.10 ml

Pi 1 = 0.3 Pf 1 = 4.2

D.F. = 1.26

| CAS #     | COMPOUND       | RESULT<br>(%, v/v) | REPORTING<br>LIMIT<br>(%, v/v) |
|-----------|----------------|--------------------|--------------------------------|
| 7782-44-7 | Oxygen +       |                    |                                |
| 7440-37-1 | Argon *        | 18.9               | 0.100                          |
| 7727-37-9 | Nitrogen       | 80.3               | 0.100                          |
| 124-38-9  | Carbon Dioxide | 0.758              | 0.100                          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

\* = Coeluting Compounds: Assumes A Ratio Of 22.53:1 By Volume

Verified By: RG Date: 11/2/99

Page No.:



# Performance Analytical Inc.

Air Quality Laboratory

A Division of Columbia Analytical Services, Inc.

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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : Emcon Alaska, Inc.

Client Sample ID : Method Blank

PAI Sample ID : P991020-MB

Test Code : GC/TCD

Instrument : HP5890/TCD #1

Analyst : Madeleine Khoubessarian

Matrix : Silco Canister

Date Sampled : NA

Date Received : NA

Date Analyzed : 10/20/99

Volume(s) Analyzed : 0.10 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

| CAS #     | COMPOUND       | RESULT<br>(%, v/v) | REPORTING<br>LIMIT<br>(%, v/v) |
|-----------|----------------|--------------------|--------------------------------|
| 7782-44-7 | Oxygen +       |                    |                                |
| 7440-37-1 | Argon *        | ND                 | 0.100                          |
| 7727-37-9 | Nitrogen       | ND                 | 0.100                          |
| 124-38-9  | Carbon Dioxide | ND                 | 0.100                          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

\* = Coeluting Compounds: Assumes A Ratio Of 22.53:1 By Volume

Verified By: RG Date: 11/2/99

Page No.:



## Performance Analytical Inc.

Air Quality Laboratory

A Division of Columbia Analytical Services, Inc.

An Employee Owned Company

### RESULTS OF TOTAL PETROLEUM HYDROCARBON (TPH) ANALYSIS

PAGE 1 OF 1

**Client : Emcon Alaska, Inc.**

**Client Project ID: Ft. Rich POL Lab/793842.086-00000**

**PAI Project ID: P9902091**

Test Code : GC/FID

Analyst : David Iwig

Instrument : HP5890A/FID #2

Matrix : Silco Canister(s)

Date Sampled : 10/18/99

Date Received : 10/20/99

Date Analyzed : 10/28/99

Volume(s) Analyzed : 1.00 ml

| Client Sample ID | PAI Sample ID | D. F. | Total Petroleum Hydrocarbons as Gasoline |                            |        |              |
|------------------|---------------|-------|--|----------------------------|--------|--------------|
|                  |               |       | Result                                   | Reporting                  | Result | Reporting    |
|                  |               |       | mg/m <sup>3</sup>                        | Limit<br>mg/m <sup>3</sup> | ppm    | Limit<br>ppm |
| 99POL020AG       | P9902091-001  | 1.26  | 94                                       | 18                         | 27     | 5.1          |
| Method Blank     | P991028-MB    | 1.00  | ND                                       | 18                         | ND     | 5.1          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Parts Per Million Results Are Based on a Molecular Weight of 86.18

Verified By: RG Date: 11/2/99



# Performance Analytical Inc.

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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : Emcon Alaska, Inc.

Client Sample ID : Method Blank

PAI Sample ID : P991028-MB

Test Code : Modified CARB Method 410

Analyst : David Iwig

Instrument : HP5890/PID #2

Matrix : Silco Canister

Date Sampled : NA

Date Received : NA

Date Analyzed : 10/28/99

Volume(s) Analyzed : 1.00 ml

Pi 1 = 0.0

Pf 1 = 0.0

D.F. = 1.00

| CAS #     | COMPOUND       | RESULT<br>mg/m <sup>3</sup> | REPORTING<br>LIMIT<br>mg/m <sup>3</sup> | RESULT<br>ppm | REPORTING<br>LIMIT<br>ppm |
|-----------|----------------|-----------------------------|---|---------------|---------------------------|
| 71-43-2   | Benzene        | ND                          | 0.16                                    | ND            | 0.050                     |
| 108-88-3  | Toluene        | ND                          | 0.19                                    | ND            | 0.050                     |
| 100-41-4  | Ethylbenzene   | ND                          | 0.22                                    | ND            | 0.050                     |
| 1330-20-7 | m- & p-Xylenes | ND                          | 0.22                                    | ND            | 0.050                     |
| 95-47-6   | o-Xylene       | ND                          | 0.22                                    | ND            | 0.050                     |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Verified By: RG

Date: 11/2/99

Page No.:

## Chain of Custody Record Analytical Services Request

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**White Copy : Accompanies Sampler**

**Yellow Copy : Sampler**





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### LABORATORY REPORT

|          |                                    |                 |          |
|----------|------------------------------------|-----------------|----------|
| Client:  | IT CORPORATION                     | Date of Report: | 02/10/00 |
| Address: | 4701 Business Park Blvd., Suite 36 | Date Received:  | 01/26/00 |
|          | Anchorage, AK 99503                | PAI Project No: | P2000152 |
| Contact: | Mr. Lance Raymore                  | Purchase Order: | Verbal   |

Client Project ID: Fort Richardson POL Testing #793842.08G00000

---

One (1) Silco Canister labeled: "00POL020AG"

---

The sample was received at the laboratory under chain of custody on January 26, 2000. The sample was received intact. The dates of analyses are indicated on the attached data sheets.

#### Hydrogen Sulfide Analysis

The sample was analyzed for Hydrogen sulfide using a gas chromatograph equipped with a sulfur chemiluminescence detector.

#### Methane Analysis

The sample was analyzed for Methane according to EPA Method 25C. The analyses were performed by gas chromatography using flame ionization detection/total combustion analysis.

#### Fixed Gases Analysis

The sample was also analyzed for fixed gases (Oxygen/Argon, Nitrogen and Carbon dioxide) using a Hewlett Packard Model 5890 gas chromatograph equipped with a thermal conductivity detector (TCD).

---

Reviewed and Approved:

David Iwig  
Analytical Chemist

Reviewed and Approved:

John Yokoyama  
Senior Chemist



# Performance Analytical Inc.

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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client: IT Corporation

Client Project ID: Fort Richardson POL Testing/793842.08G00000

PAI Project ID: P2000152

Test Code: GC/SCD for Sulfur

Instrument ID: HP 5890A/SCD #5

Analyst: David Iwig

Matrix: Silco Canister(s)

Date Sampled: 1/24/00

Date Received: 1/26/00

Date Analyzed: 1/26/00

Volume(s) Analyzed: 1.0 ml

| Client Sample ID | PAI Sample ID | D.F. | Result<br>$\mu\text{g}/\text{m}^3$ | Hydrogen Sulfide                               |               | Reporting<br>Limit<br>ppb |
|------------------|---------------|------|------------------------------------|--|---------------|---------------------------|
|                  |               |      |                                    | Reporting<br>Limit<br>$\mu\text{g}/\text{m}^3$ | Result<br>ppb |                           |
| OOPOL02OAG       | P2000152-001  | 1.32 | ND                                 | 2.80   | ND            | 2.00                      |
| Method Blank     | P000126-MB    | 1.00 | ND                                 | 2.80   | ND            | 2.00                      |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Verified By: RC

Date: 2/9/00



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## RESULTS OF METHANE ANALYSIS

PAGE 1 OF 1

**Client: IT Corporation**

**Client Project ID: Fort Richardson POL Testing/793842.08G00000**

**PAI Project ID: P2000152**

Test Code: EPA Method 25C  
Instrument ID: HP5890A/FID/TCA  
Analyst: Madeleine Khoubesserian  
Matrix: Silco Canister(s)

Date Sampled: 1/24/00  
Date Received: 1/26/00  
Date Analyzed: 1/27/00  
Volume(s) Analyzed: 0.50 ml

| Client Sample ID | PAI Sample ID | D.F. | Methane                   |                 |
|------------------|---------------|------|---------------------------|-----------------|
|                  |               |      | Concentration in ppm, v/v |                 |
|                  |               |      | Result                    | Reporting Limit |
| OOPOL02OAG       | P2000152-001  | 1.32 | 1.7                       | 0.50            |
| Method Blank     | P000127-MB    | 1.00 | ND                        | 0.50            |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Verified By: RG

Date: 2/9/00



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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : IT Corporation

Client Sample ID : OOPOL02OAG

PAI Sample ID : P2000152-001

Test Code : GC/TCD

Instrument : HP5890/TCD #1

Analyst : Madeleine Khoubessarian

Matrix : Silco Canister

Date Sampled : 1/24/00

Date Received : 1/26/00

Date Analyzed : 1/26/00

Volume(s) Analyzed : 0.10 ml

Pi1 = -0.8 Pf1 = 3.6

D.F. = 1.32

| CAS #     | COMPOUND       | RESULT<br>(%, v/v) | REPORTING<br>LIMIT<br>(%, v/v) |
|-----------|----------------|--------------------|--------------------------------|
| 7782-44-7 | Oxygen +       |                    |                                |
| 7440-37-1 | Argon *        | 16.4               | 0.100                          |
| 7727-37-9 | Nitrogen       | 81.8               | 0.100                          |
| 124-38-9  | Carbon Dioxide | 1.80               | 0.100                          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

\* = Coeluting Compounds

Verified By: RIC Date: 2/9/00

Page No.:



# Performance Analytical Inc.

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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : IT Corporation

Client Sample ID : Method Blank

PAI Sample ID : P000126-MB

Test Code : GC/TCD

Instrument : HP5890/TCD #1

Analyst : Madeleine Khoubesserian

Matrix : Silco Canister

Date Sampled : NA

Date Received : NA

Date Analyzed : 1/26/00

Volume(s) Analyzed : 0.10 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

| CAS #     | COMPOUND       | RESULT<br>(%, v/v) | REPORTING<br>LIMIT<br>(%, v/v) |
|-----------|----------------|--------------------|--------------------------------|
| 7782-44-7 | Oxygen +       |                    |                                |
| 7440-37-1 | Argon *        | ND                 | 0.100                          |
| 7727-37-9 | Nitrogen       | ND                 | 0.100                          |
| 124-38-9  | Carbon Dioxide | ND                 | 0.100                          |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

\* = Coeluting Compounds

Verified By: RG Date: 2/9/00

Page No.:



# Performance Analytical Inc.

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## RESULTS OF TOTAL PETROLEUM HYDROCARBON (TPH) ANALYSIS

PAGE 1 OF 1

**Client : IT Corporation**

**Client Project ID: Fort Richardson POL Testing/793842.08G00000**

**PAI Project ID: P2000152**

Test Code : GC/FID

Analyst : David Iwig

Instrument : HP5890A/FID #2

Matrix : Silco Canister(s)

Date Sampled : 1/24/00

Date Received : 1/26/00

Date Analyzed : 1/27/00

Volume(s) Analyzed : 1.00 ml

| Client Sample ID | PAI Sample ID   | D. F. | Total Petroleum Hydrocarbons as Gasoline |   |               |                           |
|------------------|-----------------|-------|--|---|---------------|---------------------------|
|                  |                 |       | Result<br>mg/m <sup>3</sup>              | Reporting<br>Limit<br>mg/m <sup>3</sup> | Result<br>ppm | Reporting<br>Limit<br>ppm |
| OOPOL02OAG       | P2000152-001    | 1.32  | 76                                       | 18                                      | 22            | 5.1                       |
| OOPOL02OAG       | P2000152-001DUP | 1.32  | 76                                       | 18                                      | 21            | 5.1                       |
| Method Blank     | P000127-MB      | 1.00  | ND                                       | 18                                      | ND            | 5.1                       |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Parts Per Million Results Are Based on a Molecular Weight of 86.18

Verified By: RC

Date: 2/9/00



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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : IT Corporation

Client Sample ID : OOPOLO2OAG

PAI Sample ID : P2000152-001

Test Code : Modified CARB Method 410  
Analyst : David Iwig  
Instrument : HP5890/PID #2  
Matrix : Silco Canister  
Container ID: #01383

Date Sampled : 1/24/00  
Date Received : 1/26/00  
Date Analyzed : 1/27/00  
Volume(s) Analyzed : 1.00 ml

Pi 1 = -0.8

Pf 1 = 3.6

D.F. = 1.32

| CAS #     | COMPOUND       | RESULT<br>mg/m <sup>3</sup> | REPORTING<br>LIMIT<br>mg/m <sup>3</sup> | RESULT<br>ppm | REPORTING<br>LIMIT<br>ppm |
|-----------|----------------|-----------------------------|---|---------------|---------------------------|
| 71-43-2   | Benzene        | ND                          | 0.16                                    | ND            | 0.050                     |
| 108-88-3  | Toluene        | ND                          | 0.19                                    | ND            | 0.050                     |
| 100-41-4  | Ethylbenzene   | ND                          | 0.22                                    | ND            | 0.050                     |
| 1330-20-7 | m- & p-Xylenes | ND                          | 0.22                                    | ND            | 0.050                     |
| 95-47-6   | o-Xylene       | ND                          | 0.22                                    | ND            | 0.050                     |

TR = Detected Below Indicated Reporting Limit

ND = Not Detected

Verified By: RG

Date: 2/9/00



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## RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : IT Corporation

Client Sample ID : OOPOL02OAG

PAI Sample ID : P2000152-001DUP

Test Code : Modified CARB Method 410

Analyst: David Iwig

Instrument : HP5890/PID #2

Matrix : Silco Canister

Container ID: #01383

Date Sampled : 1/24/00

Date Received : 1/26/00

Date Analyzed : 1/27/00

Volume(s) Analyzed : 1.00 ml

Pi 1 = -0.8

Pf 1 = 3.6

D.F. = 1.32

| CAS #     | COMPOUND       | RESULT<br>mg/m <sup>3</sup> | REPORTING<br>LIMIT<br>mg/m <sup>3</sup> | RESULT<br>ppm | REPORTING<br>LIMIT<br>ppm |
|-----------|----------------|-----------------------------|---|---------------|---------------------------|
| 71-43-2   | Benzene        | ND                          | 0.16                                    | ND            | 0.050                     |
| 108-88-3  | Toluene        | ND                          | 0.19                                    | ND            | 0.050                     |
| 100-41-4  | Ethylbenzene   | ND                          | 0.22                                    | ND            | 0.050                     |
| 1330-20-7 | m- & p-Xylenes | ND                          | 0.22                                    | ND            | 0.050                     |
| 95-47-6   | o-Xylene       | ND                          | 0.22                                    | ND            | 0.050                     |

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Verified By: RG

Date: 2/9/00

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### RESULTS OF ANALYSIS

PAGE 1 OF 1

Client : IT Corporation

Client Sample ID : Method Blank

PAI Sample ID : P000127-MB

Test Code : Modified CARB Method 410

Analyst : David Iwig

Instrument : HP5890/PID #2

Matrix : Silco Canister

Date Sampled : NA

Date Received : NA

Date Analyzed : 1/27/00

Volume(s) Analyzed : 1.00 ml

Pi 1 = 0.0

Pf 1 = 0.0

D.F. = 1.00

| CAS #     | COMPOUND       | RESULT<br>mg/m <sup>3</sup> | REPORTING<br>LIMIT<br>mg/m <sup>3</sup> | RESULT<br>ppm | REPORTING<br>LIMIT<br>ppm |
|-----------|----------------|-----------------------------|---|---------------|---------------------------|
| 71-43-2   | Benzene        | ND                          | 0.16                                    | ND            | 0.050                     |
| 108-88-3  | Toluene        | ND                          | 0.19                                    | ND            | 0.050                     |
| 100-41-4  | Ethylbenzene   | ND                          | 0.22                                    | ND            | 0.050                     |
| 1330-20-7 | m- & p-Xylenes | ND                          | 0.22                                    | ND            | 0.050                     |
| 95-47-6   | o-Xylene       | ND                          | 0.22                                    | ND            | 0.050                     |

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Verified By: RC

Date: 2/9/00

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## Chain of Custody Record Analytical Services Request

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**White Copy : Accompanies Sampler**

**Yellow Copy : Sampler**