

Release ID: 1548  
Seattle



January 11, 2000

Mr. Joe Hickey  
Department of Ecology  
3190 SE 160th Street  
Bellevue, WA 98008

**RE: Interim Report for Jay's Cleaners, 2350 24<sup>th</sup> Avenue East, Seattle, WA.**

Dear Mr. Hickey:

Enclosed is a copy of the Interim Report for well sampling activities conducted in 1999. If you have any question, please contact me at 425-355-2826.

Sincerely,  
Glacier Environmental Services, Inc.,

A handwritten signature in black ink, appearing to read "Curt Lightle", written over a horizontal line.

Curt Lightle  
Project Supervisor

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6/5/03 - RW

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**Glacier Environmental Services, Inc.**

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Pouch 778 Unalaska, Alaska 99685 Fax: (907) 581-2845 Phone: (907) 581-3973

# **Interim Report**

**Groundwater Treatment System  
Jay's Cleaners  
2350 24<sup>th</sup> Avenue East  
Seattle, WA**

January 11, 2000  
Project 98015

Prepared for:  
Washington State Department of Ecology  
3190 160<sup>th</sup> Avenue SE  
Bellevue, WA

Prepared by:  
Glacier Environmental Services  
12521 Evergreen Drive  
Mukilteo, WA

## **TABLE OF CONTENTS**

| <b><u>Section</u></b>                           | <b><u>Page</u></b> |
|---|--------------------|
| 1.0 Summary                                     | 1                  |
| 2.0 Sample Results                              | 1                  |
| 3.0 Conclusion                                  | 2                  |
| <br>  |                    |
| Table 1 - Sample Results                        |                    |
| <br>  |                    |
| Figure 1 - Site Vicinity Map                    |                    |
| Figure 2 – Sample Location Map                  |                    |
| <br>  |                    |
| Attachment A                                    |                    |
| Field Notes                                     |                    |
| <br>  |                    |
| Attachment B                                    |                    |
| Laboratory Analytical Data and Chain of Custody |                    |

**Jay's Cleaners  
Groundwater Treatment System  
2350 24<sup>th</sup> Avenue East  
Seattle, WA**

**1.0 Summary**

This letter report presents the findings of the June 1999 field sampling event conducted at the above referenced site. Enclosed please find the original field notes and laboratory results for groundwater monitoring and sampling for the above referenced site. As indicated on the data sheets, monitoring wells MW-1, MW-4, MW-8, MW-9, MW-11, MW-15 and MW-16 had a noticeable sheen and hydrocarbon odor. Monitoring wells MW-13 was cemented over and MW-14 was dry at a depth of 10.0 feet below grade.

In years past, the wells contained product thickness layers ranging up to several feet. However, since the winter quarter of 1997 we have not observed any free product on the top of the water column greater than an 1/8<sup>th</sup> of an inch. Also, as the annual influent sample results have shown a steady decline (please see Interim Report dated June 28, 1998) it was determined that a sampling event of all the monitoring wells was appropriate. Laboratory results from the sampling events are presented in Table 1.

**2.0 Sample Results**

As indicated in the Table 1, four of the monitoring wells have elevated levels of Gasoline Range Hydrocarbons and BTEX components. These four wells (see Figures 1 and 2) are all within 75' of the recovery well which is located down gradient from where the original release occurred. Other wells located immediately adjacent (ranging from 10-100' away) were confirmed by the laboratory to contain chemical contamination lower than the MTCA Level A cleanup levels.

**Table 1 – Monitoring Well Sample Results**

| Sample ID | Date   | Benzene (ug/L) | Tolulene <sup>1</sup> (ug/L) | Xylene (ug/L) | Ethyl-Benzene | GRH (mg/l) |
|-----------|--------|----------------|------------------------------|---------------|---------------|------------|
| MW-8      | 6/4/99 | 570            | 6130                         | 17000         | 1220          | 43700      |
| MW-15     | 6/4/99 | 37.9           | 367                          | 3100          | 547           | 24700      |
| MW-16     | 6/4/99 | ND             | 3.39                         | 8.93          | 1.93          | 182        |

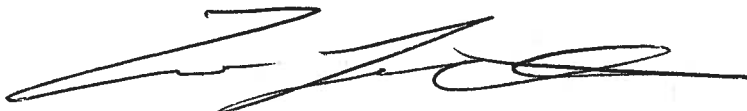
|                               |        |        |         |         |         |               |
|-------------------------------|--------|--------|---------|---------|---------|---------------|
| MW-11                         | 6/4/99 | ND     | 35.8    | ND      | ND      | ND            |
| MW-9                          | 6/4/99 | 610    | 4990    | 6760    | 1230    | 54400         |
| MW-1                          | 6/4/99 | ND     | 3.59    | 3.87    | .830    | ND            |
| MW-4                          | 6/4/99 | 3580   | 3490    | 3920    | 788     | 30800         |
| MW-7                          | 6/4/99 | ND     | 3.38    | 2.29    | ND      | ND            |
| MW-12                         | 6/4/99 | ND     | 2.99    | 1.14    | ND      | ND            |
| MW-10                         | 6/4/99 | ND     | ND      | 3.03    | ND      | ND            |
| MW-6                          | 6/4/99 | ND     | 2.88    | ND      | ND      | ND            |
| MTCA Level A<br>Action Levels |        | 1 ug/l | 40 ug/l | 30 ug/l | 20 ug/l | 1,000<br>mg/l |

1. Lab reported 3-4 ppb laboratory cross contamination problem with Toluene.

### 3.0 Conclusion

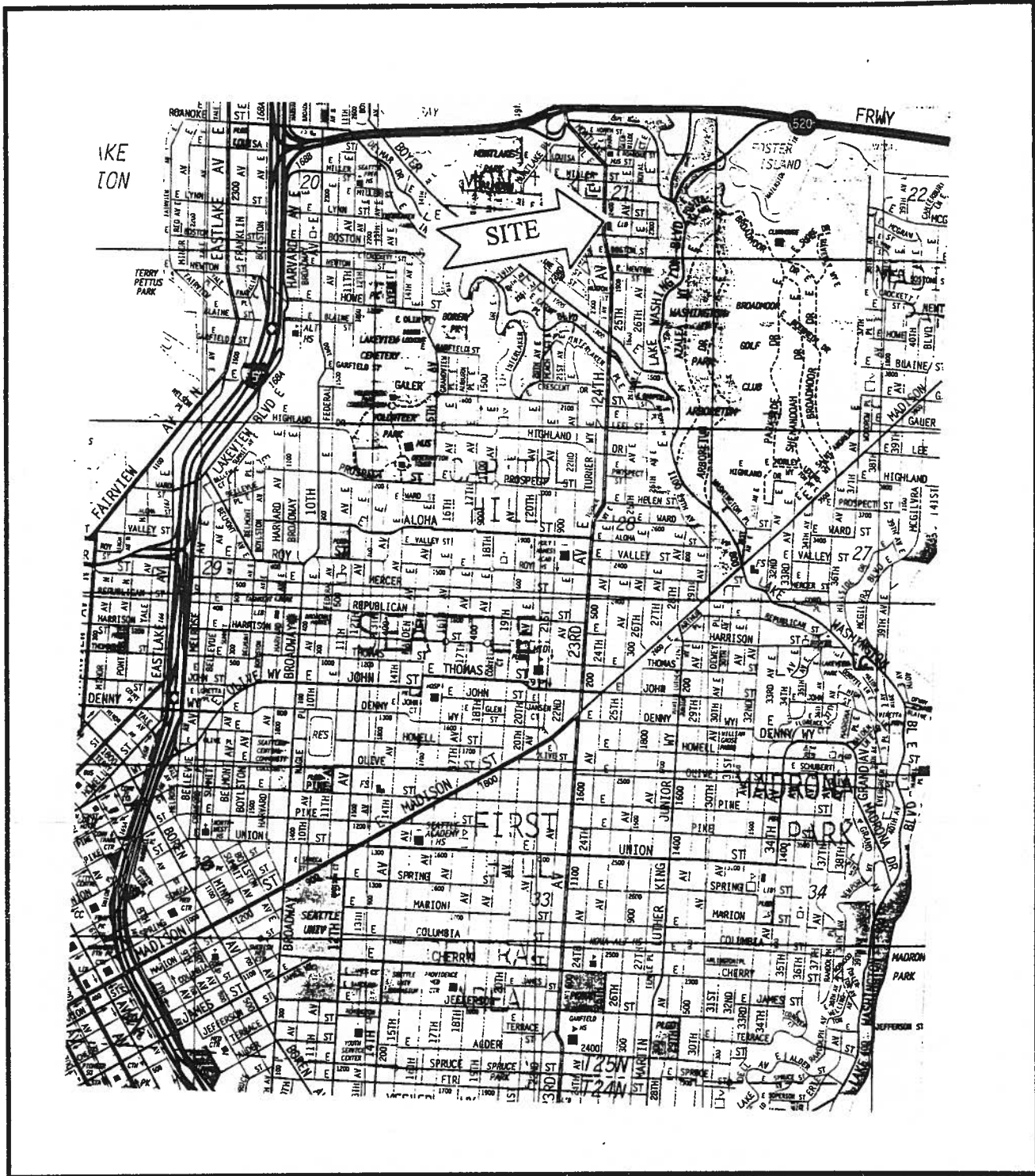
Based on this data, it seems possible that the impact to the groundwater is confined to the area immediately surrounding the impacted wells, and is possibly a result of contaminated soil which remains in place around these wells. Therefore, if we can devise a method to remediate the PCS surrounding these wells, we might be able to speed the cleanup process up significantly. One possible method of achieving this goal is to install a limited air sparging system. At this time we are recommending that consideration be given to developing a method to implement such a system. If you would like to discuss some ideas we have to launch a pilot project to test the effectiveness of such a system, please contact me at 425-355-2826. Otherwise we will continue to maintain and monitor the current systems already in place.

Best Regards,  
Glacier Environmental Services, Inc.,



Curt Lightle  
Project Supervisor

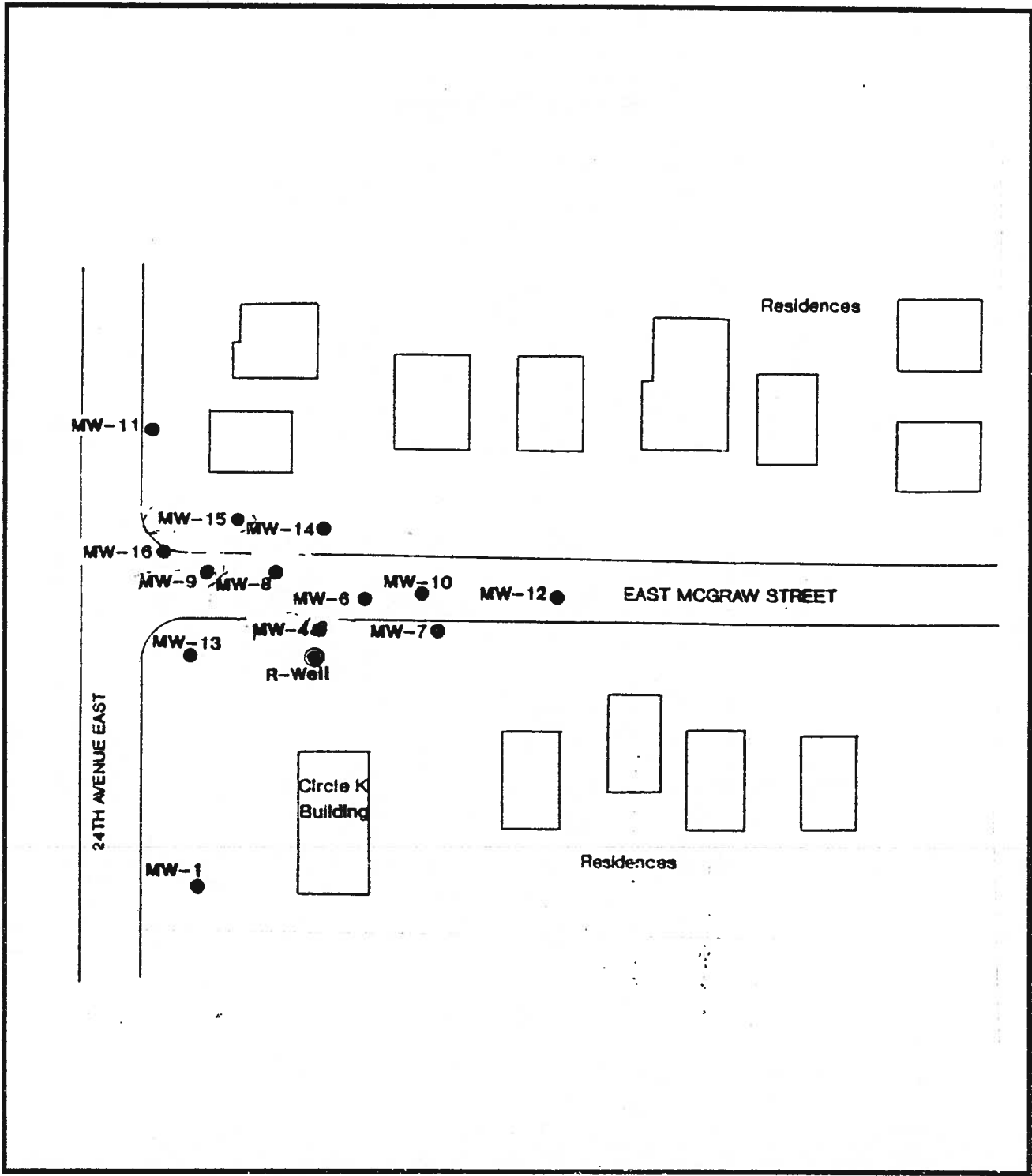
**Figures**



**GLACIER ENVIRONMENTAL SERVICES, INC.**  
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 Mukilteo, WA 98275

DATE: 10/31/99  
 JOB #: 98-015

Figure -1 Site Vicinity Map  
 Jay's Cleaners  
 2350 24th NE  
 Seattle, WA



**GLACIER ENVIRONMENTAL SERVICES, INC.**  
 12521 Evergreen Drive, Suite A  
 Mukilteo, WA 98275

DATE: 10/31/99  
 JOB #: 98015

**Figure -2 Sample Location Map**  
 Jay's Cleaners  
 2350 24th Avenue East  
 Seattle, WA



**Attachment A**


## GROUNDWATER MONITORING AND SAMPLING DATA

|  |                              |
|--|------------------------------|
| Job Name: Circle K/Montlake              | Sampling Technician: R.D.N   |
| Address: 2350 24th Avenue E, Seattle, WA | Date Gauged: 6/4/99 & 6/7/99 |
| Job Number: 783413                       | Date Sampled: " "            |

|  |        |       |       |       |       |       |                 |                 |
|--|--------|-------|-------|-------|-------|-------|-----------------|-----------------|
|  | * MW-4 | MW-7  | MW-12 | MW-10 | MW-6  | MW-8  | MW-15           | MW-16           |
| WELL   | MW-4   | MW-7  | MW-12 | MW-10 | MW-6  | MW-8  | MW-15           | MW-16           |
| Size   | 2"     | 2"    | 2"    | 2"    | 2"    | 2"    | 2"              | 2"              |
| Sample Order   |        |       |       |       |       |       |                 |                 |
| <b>GAUGING DATA</b>  |        |       |       |       |       |       |                 |                 |
| Gauge Time   | 9:50   | 10:04 | 10:21 | 10:33 | 10:38 | 10:48 | 11:06           | 11:20           |
| DT Bottom  | 17.7   | 12.7  | 23.5  | 22.3  | 23.8  | 19.93 | 16.8            | <del>18.8</del> |
| DT Product   | 13.89  |       |       |       |       |       | 10.79           |                 |
| DT Water   | 13.9   | 9.87  | 11.2  | 10.53 | 11.66 | 11.9  | <del>10.8</del> | <del>10.8</del> |
| Water Column   | 3.8    | 12.83 | 12.3  | 11.77 | 12.14 | 8.03  | 6.0             | 8.17            |
| Dis. Oxygen  |        |       |       |       |       |       |                 |                 |
| <b>PURGING DATA</b>  |        |       |       |       |       |       |                 |                 |
| Method   | DB     | DB    | DB    | I     |       |       |                 |                 |
| 3 casing volumes   | 1.88   | 6.27  | 6.01  | 5.75  | 5.94  | 3.92  | 2.9             | 3.99            |
| Gallons removed  | ~2.00  | ~6.3  | ~6.0  | ~5.75 | ~6.0  | ~4.0  | ~3.0            | ~4.0            |
| <b>SAMPLING DATA</b><br>(Collect samples as described in work order) |        |       |       |       |       |       |                 |                 |
| Time   | 1:12   | 2:20  | 2:10  | 12:52 | 1:03  | 1:20  | 1:30            | 1:40            |
| Method   |        |       |       |       |       |       |                 |                 |

- 1) Methods include: Disposable bailer (DB), Submersible Pump (SP), Diaphragm Pump (DP), Injector (I).
- 2) Water Column = DTB-DTW
- 3) Estimate 3 casing volumes from chart on back of page.

Note any unusual observations below.

- MW-4 → thin layer of product, Heavy Odor, Dark Sheen.  
↳ 4 well is not perfectly vertical.
- MW-12 → Nit on map
- MW-8 → Sheen; Odor → Not detected by oil sensor.  
↳ 2 1" slits (2) at top of well →   
↳ but very thin & covered by well cap.
- MW-15 → thin layer product odor; sheen
- MW-16 → v. thin layer product  
↳ < 0.01.  
odor, sheen.

## GROUNDWATER MONITORING AND SAMPLING DATA

|  |                             |
|--|-----------------------------|
| Job Name: Circle K/Montlake              | Sampling Technician: R.D.N. |
| Address: 2350 24th Avenue E, Seattle, WA | Date Gauged: 6/4/99         |
| Job Number: 783413                       | Date Sampled: "             |

| WELL   | MW-11             | MW-9  | MW-1  | MW-14 |  |  |  |
|--|-------------------|-------|-------|-------|--|--|--|
| Size   | 2"                | 2"    | 2"    | 2"    |  |  |  |
| Sample Order   |                   |       |       |       |  |  |  |
| <b>GAUGING DATA</b>  |                   |       |       |       |  |  |  |
| Gauge Time   | 11:42             | 12:00 | 12:20 | 12:40 |  |  |  |
| DT Bottom  | 21.3              | 22.3  | 22.13 | 10.1  |  |  |  |
| DT Product   |                   | 11.67 |       |       |  |  |  |
| DT Water   | 9.77              | 11.68 | 12.36 | DRY   |  |  |  |
| Water Column   | 11.53             | 10.62 | 9.77  |       |  |  |  |
| Dis. Oxygen  |                   |       |       |       |  |  |  |
| <b>PURGING DATA</b>  |                   |       |       |       |  |  |  |
| Method   | <del>DB</del> → I | DB    | NA    |       |  |  |  |
| 3 casing volumes   | 5.6               | 5.2   | 4.8   |       |  |  |  |
| Gallons removed  | ~5.5              | ~5.0  | ~5.0  |       |  |  |  |
| <b>SAMPLING DATA</b><br>(Collect samples as described in work order) |                   |       |       |       |  |  |  |
| Time   | 1:55              | 2:05  | 2:15  |       |  |  |  |
| Method   |                   |       |       |       |  |  |  |

- 1) Methods include: Disposable bailer (DB), Submersible Pump (SP), Diaphragm Pump (DP), Injector (I).
- 2) Water Column = DTB-DTW
- 3) Estimate 3 casing volumes from chart on back of page.

Note any unusual observations below.

- MW-11 → Not on map.  
• thin layer of product; odor, sheen
- MW-9 → Product layer; odor; sheen  
↳ Well cover difficult to remove.
- MW-14 → top of well has two cracks

- (can't see)
- MW-13 → cemented over
  - MW-1 → sheen, odor  
↳ not detected by sensor  
↳ well cap has 4 slits.



**Attachment B**



Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508  
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 541.383.9310 fax 541.382.7588

|  |  |  |
|--|--|--|
| IT Corporation - Renton<br>555 South Renton Village Place, Ste 700<br>Renton, WA 98055 | Project: Circle K/Montlake<br>Project Number: 783413<br>Project Manager: Steve Hartman | Sampled: 6/4/99 to 6/7/99<br>Received: 6/8/99<br>Reported: 6/17/99 15:46 |
|--|--|--|

**ANALYTICAL REPORT FOR SAMPLES:**

| Sample Description | Laboratory Sample Number | Sample Matrix | Date Sampled |
|--------------------|--------------------------|---------------|--------------|
| MW-11              | B906236-01               | Water         | 6/7/99       |
| MW-9               | B906236-02               | Water         | 6/7/99       |
| MW-1               | B906236-03               | Water         | 6/7/99       |
| MW-4               | B906236-04               | Water         | 6/7/99       |
| MW-7               | B906236-05               | Water         | 6/4/99       |
| MW-12              | B906236-06               | Water         | 6/4/99       |
| MW-10              | B906236-07               | Water         | 6/7/99       |
| MW-6               | B906236-08               | Water         | 6/7/99       |
| MW-8               | B906236-09               | Water         | 6/7/99       |
| MW-15              | B906236-10               | Water         | 6/7/99       |
| MW-16              | B906236-11               | Water         | 6/7/99       |

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*The results in this report apply to the samples analyzed in accordance with the chain of custody document.  
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 Joy B Zhang, Project Manager

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**Environmental Laboratory Network**



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|--|--|--|

**Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A  
 North Creek Analytical - Spokane**

| Analyte                     | Batch Number | Date Prepared | Date Analyzed | Surrogate Limits         | Reporting Limit | Result | Units               | Notes* |
|-----------------------------|--------------|---------------|---------------|--------------------------|-----------------|--------|---------------------|--------|
| <b>MW-11</b>                |              |               |               | <b><u>B906236-01</u></b> |                 |        | <b><u>Water</u></b> |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                          | 250             | ND     | ug/l                |        |
| Benzene                     | "            | "             | "             |                          | 2.50            | ND     | "                   |        |
| Toluene                     | "            | "             | "             |                          | 2.50            | 35.8   | "                   | 1      |
| Ethylbenzene                | "            | "             | "             |                          | 2.50            | ND     | "                   |        |
| Xylenes (total)             | "            | "             | "             |                          | 5.00            | ND     | "                   |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150                 |                 | 103    | %                   |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142                 |                 | 80.4   | "                   |        |
| <b>MW-9</b>                 |              |               |               | <b><u>B906236-02</u></b> |                 |        | <b><u>Water</u></b> |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                          | 2500            | 54400  | ug/l                |        |
| Benzene                     | "            | "             | "             |                          | 25.0            | 610    | "                   |        |
| Toluene                     | "            | "             | "             |                          | 25.0            | 4990   | "                   | 1,5    |
| Ethylbenzene                | "            | "             | "             |                          | 25.0            | 1230   | "                   |        |
| Xylenes (total)             | "            | "             | "             |                          | 50.0            | 6760   | "                   |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150                 |                 | 105    | %                   |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142                 |                 | 88.0   | "                   |        |
| <b>MW-1</b>                 |              |               |               | <b><u>B906236-03</u></b> |                 |        | <b><u>Water</u></b> |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                          | 50.0            | ND     | ug/l                |        |
| Benzene                     | "            | "             | "             |                          | 0.500           | ND     | "                   |        |
| Toluene                     | "            | "             | "             |                          | 0.500           | 3.59   | "                   | 1      |
| Ethylbenzene                | "            | "             | "             |                          | 0.500           | 0.830  | "                   |        |
| Xylenes (total)             | "            | "             | "             |                          | 1.00            | 3.87   | "                   |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150                 |                 | 126    | %                   |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142                 |                 | 96.0   | "                   |        |
| <b>MW-4</b>                 |              |               |               | <b><u>B906236-04</u></b> |                 |        | <b><u>Water</u></b> |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                          | 5000            | 30800  | ug/l                |        |
| Benzene                     | "            | "             | "             |                          | 50.0            | 3580   | "                   |        |
| Toluene                     | "            | "             | "             |                          | 50.0            | 3490   | "                   | 1,5    |
| Ethylbenzene                | "            | "             | "             |                          | 50.0            | 788    | "                   |        |
| Xylenes (total)             | "            | "             | "             |                          | 100             | 3920   | "                   |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150                 |                 | 3.92   | %                   | 2      |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142                 |                 | 2.16   | "                   | 2      |

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\*Refer to end of report for text of notes and definitions.

Joy B Chang, Project Manager

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|--|--|--|

**Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A  
 North Creek Analytical - Spokane**

| Analyte                     | Batch Number | Date Prepared | Date Analyzed | Surrogate Limits  | Reporting Limit | Result       | Units | Notes* |
|-----------------------------|--------------|---------------|---------------|-------------------|-----------------|--------------|-------|--------|
| <b>MW-7</b>                 |              |               |               | <b>B906236-05</b> |                 | <b>Water</b> |       |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                   | 50.0            | ND           | ug/l  |        |
| Benzene                     | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Toluene                     | "            | "             | "             |                   | 0.500           | 3.38         | "     | 1      |
| Ethylbenzene                | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Xylenes (total)             | "            | "             | "             |                   | 1.00            | 2.99         | "     |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150          |                 | 110          | %     |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142          |                 | 89.2         | "     |        |
| <b>MW-12</b>                |              |               |               | <b>B906236-06</b> |                 | <b>Water</b> |       |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                   | 50.0            | ND           | ug/l  |        |
| Benzene                     | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Toluene                     | "            | "             | "             |                   | 0.500           | 2.99         | "     | 1      |
| Ethylbenzene                | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Xylenes (total)             | "            | "             | "             |                   | 1.00            | 1.14         | "     |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150          |                 | 108          | %     |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142          |                 | 90.8         | "     |        |
| <b>MW-10</b>                |              |               |               | <b>B906236-07</b> |                 | <b>Water</b> |       |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                   | 50.0            | ND           | ug/l  |        |
| Benzene                     | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Toluene                     | "            | "             | "             |                   | 0.500           | 3.03         | "     | 1      |
| Ethylbenzene                | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Xylenes (total)             | "            | "             | "             |                   | 1.00            | ND           | "     |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150          |                 | 86.4         | %     |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142          |                 | 74.4         | "     |        |
| <b>MW-6</b>                 |              |               |               | <b>B906236-08</b> |                 | <b>Water</b> |       |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                   | 50.0            | ND           | ug/l  |        |
| Benzene                     | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Toluene                     | "            | "             | "             |                   | 0.500           | 2.88         | "     | 1      |
| Ethylbenzene                | "            | "             | "             |                   | 0.500           | ND           | "     |        |
| Xylenes (total)             | "            | "             | "             |                   | 1.00            | ND           | "     |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150          |                 | 111          | %     |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142          |                 | 96.8         | "     |        |

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\*Refer to end of report for text of notes and definitions.

Joy B Chang, Project Manager

**North Creek Analytical, Inc.**  
 Environmental Laboratory Network



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| IT Corporation - Renton<br>555 South Renton Village Place, Ste 700<br>Renton, WA 98055 | Project: Circle K/Montlake<br>Project Number: 783413<br>Project Manager: Steve Hartman | Sampled: 6/4/99 to 6/7/99<br>Received: 6/8/99<br>Reported: 6/17/99 15:46 |
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**Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A  
 North Creek Analytical - Spokane**

| Analyte                     | Batch Number | Date Prepared | Date Analyzed | Surrogate Limits  | Reporting Limit | Result | Units        | Notes* |
|-----------------------------|--------------|---------------|---------------|-------------------|-----------------|--------|--------------|--------|
| <b>MW-8</b>                 |              |               |               | <b>B906236-09</b> |                 |        | <b>Water</b> |        |
| Gasoline Range Hydrocarbons | 0690050      | 6/15/99       | 6/15/99       |                   | 2500            | 43700  | ug/l         |        |
| Benzene                     | "            | "             | "             |                   | 25.0            | 570    | "            |        |
| Toluene                     | "            | "             | "             |                   | 25.0            | 6130   | "            | 1,5    |
| Ethylbenzene                | "            | "             | "             |                   | 25.0            | 1220   | "            |        |
| Xylenes (total)             | "            | "             | "             |                   | 50.0            | 17000  | "            |        |
| Surrogate: 4-BFB (FID)      | "            | "             | "             | 50.0-150          |                 | 100    | %            |        |
| Surrogate: 4-BFB (PID)      | "            | "             | "             | 53.0-142          |                 | 91.6   | "            |        |

|                             |         |         |         |                   |      |       |              |   |
|-----------------------------|---------|---------|---------|-------------------|------|-------|--------------|---|
| <b>MW-15</b>                |         |         |         | <b>B906236-10</b> |      |       | <b>Water</b> |   |
| Gasoline Range Hydrocarbons | 0690050 | 6/15/99 | 6/15/99 |                   | 250  | 24700 | ug/l         |   |
| Benzene                     | "       | "       | "       |                   | 2.50 | 37.9  | "            |   |
| Toluene                     | "       | "       | "       |                   | 2.50 | 367   | "            | 1 |
| Ethylbenzene                | "       | "       | "       |                   | 2.50 | 547   | "            |   |
| Xylenes (total)             | "       | "       | "       |                   | 5.00 | 3100  | "            |   |
| Surrogate: 4-BFB (FID)      | "       | "       | "       | 50.0-150          |      | 177   | %            | 3 |
| Surrogate: 4-BFB (PID)      | "       | "       | "       | 53.0-142          |      | 126   | "            |   |

|                             |         |         |         |                   |       |      |              |   |
|-----------------------------|---------|---------|---------|-------------------|-------|------|--------------|---|
| <b>MW-16</b>                |         |         |         | <b>B906236-11</b> |       |      | <b>Water</b> |   |
| Gasoline Range Hydrocarbons | 0690050 | 6/15/99 | 6/15/99 |                   | 50.0  | 182  | ug/l         |   |
| Benzene                     | "       | "       | "       |                   | 0.500 | ND   | "            |   |
| Toluene                     | "       | "       | "       |                   | 0.500 | 3.39 | "            | 1 |
| Ethylbenzene                | "       | "       | "       |                   | 0.500 | 1.93 | "            |   |
| Xylenes (total)             | "       | "       | "       |                   | 1.00  | 8.93 | "            |   |
| Surrogate: 4-BFB (FID)      | "       | "       | "       | 50.0-150          |       | 112  | %            |   |
| Surrogate: 4-BFB (PID)      | "       | "       | "       | 53.0-142          |       | 97.2 | "            |   |

  
 Joy B Chang, Project Manager





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|--|--|--|

**Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A/Quality Control  
 North Creek Analytical - Spokane**

| Analyte                     | Date Analyzed | Spike Level | Sample Result                 | QC Result | Reporting Limit Units | Recov. Limits                          | Recov. % | RPD Limit | RPD % | Notes* |
|-----------------------------|---------------|-------------|-------------------------------|-----------|-----------------------|--|----------|-----------|-------|--------|
| <b>Batch: 0690050</b>       |               |             | <b>Date Prepared: 6/15/99</b> |           |                       | <b>Extraction Method: GC Volatiles</b> |          |           |       |        |
| <b>Blank</b>                |               |             | <b>0690050-BLK1</b>           |           |                       |  |          |           |       |        |
| Gasoline Range Hydrocarbons | 6/15/99       |             |                               | 56.0      | ug/l                  | 50.0                                   |          |           |       | 5      |
| Benzene                     | "             |             |                               | ND        | "                     | 0.500                                  |          |           |       |        |
| Toluene                     | "             |             |                               | 5.54      | "                     | 0.500                                  |          |           |       | 1      |
| Ethylbenzene                | "             |             |                               | ND        | "                     | 0.500                                  |          |           |       |        |
| Xylenes (total)             | "             |             |                               | ND        | "                     | 1.00                                   |          |           |       |        |
| Surrogate: 4-BFB (FID)      | "             | 25.0        |                               | 22.9      | "                     | 50.0-150                               | 91.6     |           |       |        |
| Surrogate: 4-BFB (PID)      | "             | 25.0        |                               | 17.9      | "                     | 53.0-142                               | 71.6     |           |       |        |
| <b>LCS</b>                  |               |             | <b>0690050-BS1</b>            |           |                       |  |          |           |       |        |
| Gasoline Range Hydrocarbons | 6/15/99       | 1000        |                               | 757       | ug/l                  | 70.0-150                               | 75.7     |           |       |        |
| Surrogate: 4-BFB (FID)      | "             | 25.0        |                               | 28.6      | "                     | 50.0-150                               | 114      |           |       |        |
| <b>LCS</b>                  |               |             | <b>0690050-BS2</b>            |           |                       |  |          |           |       |        |
| Benzene                     | 6/15/99       | 10.0        |                               | 8.85      | ug/l                  | 80.0-120                               | 88.5     |           |       |        |
| Toluene                     | "             | 10.0        |                               | 10.3      | "                     | 80.0-120                               | 103      |           |       |        |
| Ethylbenzene                | "             | 10.0        |                               | 8.60      | "                     | 80.0-120                               | 86.0     |           |       |        |
| Xylenes (total)             | "             | 30.0        |                               | 24.5      | "                     | 80.0-120                               | 81.7     |           |       |        |
| Surrogate: 4-BFB (PID)      | "             | 25.0        |                               | 18.4      | "                     | 53.0-142                               | 73.6     |           |       |        |
| <b>Duplicate</b>            |               |             | <b>0690050-DUP1</b>           |           | <b>B906236-11</b>     |  |          |           |       |        |
| Gasoline Range Hydrocarbons | 6/15/99       |             | 182                           | 127       | ug/l                  |  |          | 60.0      | 35.6  |        |
| Surrogate: 4-BFB (FID)      | "             | 25.0        |                               | 21.4      | "                     | 50.0-150                               | 85.6     |           |       |        |
| Surrogate: 4-BFB (PID)      | "             | 25.0        |                               | 18.8      | "                     | 53.0-142                               | 75.2     |           |       |        |
| <b>Matrix Spike</b>         |               |             | <b>0690050-MS1</b>            |           | <b>B906236-11</b>     |  |          |           |       |        |
| Gasoline Range Hydrocarbons | 6/15/99       | 1000        | 182                           | 611       | ug/l                  | 70.0-130                               | 42.9     |           |       | 4      |
| Surrogate: 4-BFB (FID)      | "             | 25.0        |                               | 27.4      | "                     | 50.0-150                               | 110      |           |       |        |
| <b>Matrix Spike</b>         |               |             | <b>0690050-MS2</b>            |           | <b>B906236-11</b>     |  |          |           |       |        |
| Benzene                     | 6/15/99       | 10.0        | ND                            | 7.52      | ug/l                  | 54.0-143                               | 75.2     |           |       |        |
| Toluene                     | "             | 10.0        | 3.39                          | 9.76      | "                     | 48.0-145                               | 63.7     |           |       |        |
| Ethylbenzene                | "             | 10.0        | 1.93                          | 7.26      | "                     | 49.0-142                               | 53.3     |           |       |        |
| Xylenes (total)             | "             | 30.0        | 8.93                          | 23.4      | "                     | 55.0-140                               | 48.2     |           |       | 4      |
| Surrogate: 4-BFB (PID)      | "             | 25.0        |                               | 19.5      | "                     | 53.0-142                               | 78.0     |           |       |        |

North Creek Analytical - Bothell

\*Refer to end of report for text of notes and definitions.

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**Notes and Definitions**

| # | Note |
|---|------|
|---|------|

- 1 This analyte was detected in Method Blank at 5.54 ug/L, a suspected laboratory contaminant.
- 2 The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration.
- 3 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
- 4 The spike recovery for this QC sample is outside of NCA established control limits. Alternate sources of QC have been used to validate the batch.
- 5 The method blank contains analyte at a concentration above the MRL. This concentration is less than 5% of the sample result, which is negligible according to method criteria.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- Recov. Recovery
- RPD Relative Percent Difference

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