



23 November 1998

Mr. Emil Klawitter  
Department of the Navy  
Northern Division, Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, Pennsylvania 19113

RE: Quarterly Progress Report on Soil Vapor Extraction/Aquifer Air Sparging  
Remedial System Operations for the Period 1 July through 30 September 1998  
Navy Exchange Service Station (Building 538), Naval Air Station Brunswick, Maine  
Contract D62472-92-D-1296, Contract Task Order No. 0035  
EA Project No. 29600.35

Dear Mr. Klawitter:

EA Engineering, Science, and Technology is pleased to provide two copies of this progress report containing operation, field, and laboratory results in support of the subject activities performed at the Navy Exchange (NEX) service station, Building 538, Naval Air Station, Brunswick, Maine (Figure 1). Deliverables forwarded by this submission include soil vapor extraction/aquifer air sparging (SVE/AAS) systems operations data (Attachment A), ground-water purging and sampling forms (Attachment B), water quality indicator parameter data (Attachment C), and analytical results for ground-water samples collected at 5 ground-water monitoring wells (Attachment D).

EA has prepared this submittal in conformance with the format suggested in the Navy's 25 September 1998 letter to MEDEP (*Recommended Changes to the NEX Quarterly Report*) and as further suggested in the MEDEP letter response dated 22 October 1998 (Attachment E). As requested by MEDEP, responses to MEDEP comments from previous NEX quarterly progress reporting are included with this submittal (Attachment F).

Summary tables are provided for SVE/AAS system performance (Table 1), well gauging (Table 2), field water quality indicator parameters (Table 3), and historical ground-water laboratory analytical results (Table 4).

## **SOIL VAPOR EXTRACTION/AQUIFER AIR SPARGING OPERATIONS SUMMARY**

The SVE system began operation on 15 November 1993. The AAS system was permanently activated on 18 July 1994. During the current operations period, 1 July through 30 September 1998, SVE trenches SVE-3 through SVE-8 were continuously activated. Sparge wells AAS-3 through AAS-7, AAS-11, and AAS-12 were continuously activated throughout the reporting period. Sparge well AAS-13 remained offline from July through September 1998.

Figure 2 presents daily and cumulative total volatile hydrocarbon (TVH) removal rates based on historical NEX treatment system performance. Notable operational milestones, including system additions/enhancements, operational interruptions, and unusually high TVH recovery intervals, are included on the figure.

### **Soil Vapor Extraction System Performance**

The SVE system operated continuously during the reporting period without operational anomalies or significant periods of operational interruption. Quantitative estimates of TVH removal rates from individual SVE trenches were prepared based on monitoring data collected using a Foxboro TVA-1000 photoionization/flame ionization detector. SVE trenches SVE-5 through SVE-8 are connected to a common trunk line returning from the remediation zone to the treatment plant; thus, the hydrocarbon removal rate for these trenches is provided as a composite. These data are summarized in Table 1. For calculation of the daily TVH removal rate, it was assumed that daily flow rate remained constant in individual SVE influent lines. Field data collected during the SVE/AAS system operations and maintenance visits are provided in Attachment A.

No exceedances of the MEDEP air discharge limit of 10 lb/hour, or 100 lb/day, of petroleum hydrocarbons were observed. A granular activated carbon changeout was performed on 6 July 1998.

### **Aquifer Air Sparging System Performance**

Seven sparge wells (AAS-3 through AAS-7 and AAS-11 through AAS-12) operated simultaneously throughout the reporting period. Sparge well AAS-13 remained offline through September 1998. No operational anomalies or significant periods of operational interruption occurred during this reporting period. Field data collected during the site visits are provided in Attachment A.

### **Well Gauging and Water Quality Indicator Parameter Measurements**

Well gauging was performed and water quality measurements were recorded during routine operations and maintenance visits conducted on a bi-monthly schedule throughout the reporting period (total of 6 visits). Gauging of monitoring wells and non-active air sparging wells confirmed the absence of measurable (i.e., <0.01 ft) light, non-aqueous phase liquid (LNAPL) in site wells during the reporting period. Sparge wells AAS-3 through AAS-7 and AAS-11 through

AAS-13 were not gauged during the gauging events due to the presence of sparge well manifolds atop the well heads and active sparging at these locations. Sparge well AAS-9 was found to be dry throughout the report period. Figure 3 provides interpreted water table elevations and direction of ground-water flow based on data collected during the 15 September 1998 gauging event. Field records of well gauging are provided in Attachment B. Well gauging data for the reporting period are summarized in Table 2.

Water quality indicator parameter measurements, including temperature, conductivity, pH, redox, and dissolved oxygen, were obtained using a YSI Model 600XL water quality meter. Water quality indicator parameter measurements were not obtainable at sparge well AAS-9 during the reporting period as this well was observed to be dry. Field records of water quality parameter measurements are provided in Attachment C.

### **QUARTERLY GROUND-WATER SAMPLING**

Ground-water sampling was performed on 15 September 1998 at 5 monitoring wells (MW-NASB-023 through MW-NASB-026 and MW-NASB-225) in the vicinity of the NEX service station. Prior to ground-water sample collection, each of the monitoring wells was gauged to determine the absence/presence of LNAPL, depth to ground water, and depth to bottom of well using a Solinst Model 121 oil/water interface probe graduated in 0.01-ft intervals. Well gauging confirmed the absence of LNAPL at the 5 monitoring well locations.

Well purging and ground-water sampling was conducted using a low-flow sampling technique. Water quality indicator parameters, including pH, conductivity, temperature, dissolved oxygen, Eh, and turbidity, were monitored during well purging. Ground-water samples were collected following stabilization of water quality indicator parameters, achieved when three consecutive measurements were within 10 percent agreement of the previous reading, and when turbidity measurements were reduced to below 10 nephelometric turbidity units (NTU). At MW-NASB-025, the turbidity parameter stabilized to within 10 percent on three successive readings although the measurements were in excess of 10 NTU (20 NTU). Field records of well gauging, purging, and sampling are provided in Attachment B.

One ground-water sample was collected from each of 5 monitoring well locations. In addition, 1 duplicate sample was collected from well MW-NASB-026. One equipment rinsate blank was collected by running deionized water through the submersible pump equipment and into appropriate sample containers. To assess the potential for sample contamination during transport, 1 trip blank sample was also analyzed. Samples were analyzed by EA Laboratories, a State of Maine Department of Human Services (MDHS)-approved laboratory. Ground-water samples, the duplicate sample, and the equipment rinsate blank were submitted for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary-butyl ether (MTBE) by U.S. Environmental Protection Agency (EPA) Method 602, total petroleum hydrocarbon as gasoline-range organics (TPH-GRO) by MDHS Health and Environmental Testing Laboratory (HETL) Laboratory Operating Procedure (LOP) Method 4.2.17, and TPH as diesel-range organics (DRO) by the MDHS-HETL LOP Method 4.1.25. The requested analytical method for BTEX and MTBE (EPA 602) was not performed due to laboratory instrument failure.

To ensure analysis within the required holding time, EPA Method 8260 was performed. The trip blank sample was also analyzed for the presence of BTEX and MTBE by EPA Method 8260. Attachment D contains the complete laboratory analytical report.

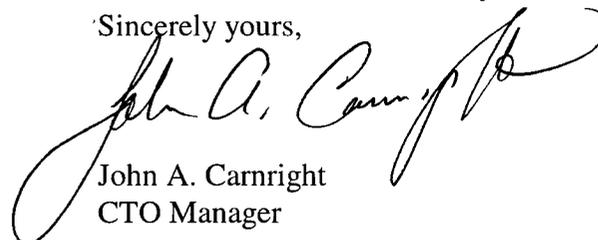
Table 4 summarizes the historical laboratory analytical results for ground-water samples collected on 15 September 1998 and also incorporates historical analytical results for ground-water analyzed for 18 previous ground-water sampling events at the NEX site since May 1992. Concentrations of analytes exceeding current MEDEP stringent cleanup goals for site ground water are denoted in bold in Table 4.

Based on the analytical results of the ground-water samples, remedial system operations are currently focused in the areas between MW-NASB-026 and MW-NASB-225. To further this effort, EA is performing additional activities at the NEX, including an extensive SVE/AAS system expansion. This effort includes the installation of up to three new AAS points, two of which will be focused in the vicinity of MW-NASB-225. A third new AAS point will be installed near MW-NASB-026. Also planned is the expansion of the SVE lateral trench network in the vicinity of the NEX dispenser pump island near MW-NASB-225. The objective of this expansion is to enhance/facilitate VOC removal in this area. These improvements are currently ongoing and scheduled for completion, startup/proveout, and full-scale operation during the next operational quarter.

Also scheduled is the installation of a new downgradient ground-water monitoring well in the area south of MW-NASB-225. This well will provide additional ground-water data as needed to replace former monitoring well MW-NASB-027. Installation of the new monitoring well is planned for the October-December 1998 operational quarter. The well will be sampled during the ground-water sampling event scheduled for December 1998.

It has been our pleasure providing Northern Division these data. If there are any questions, please do not hesitate to call.

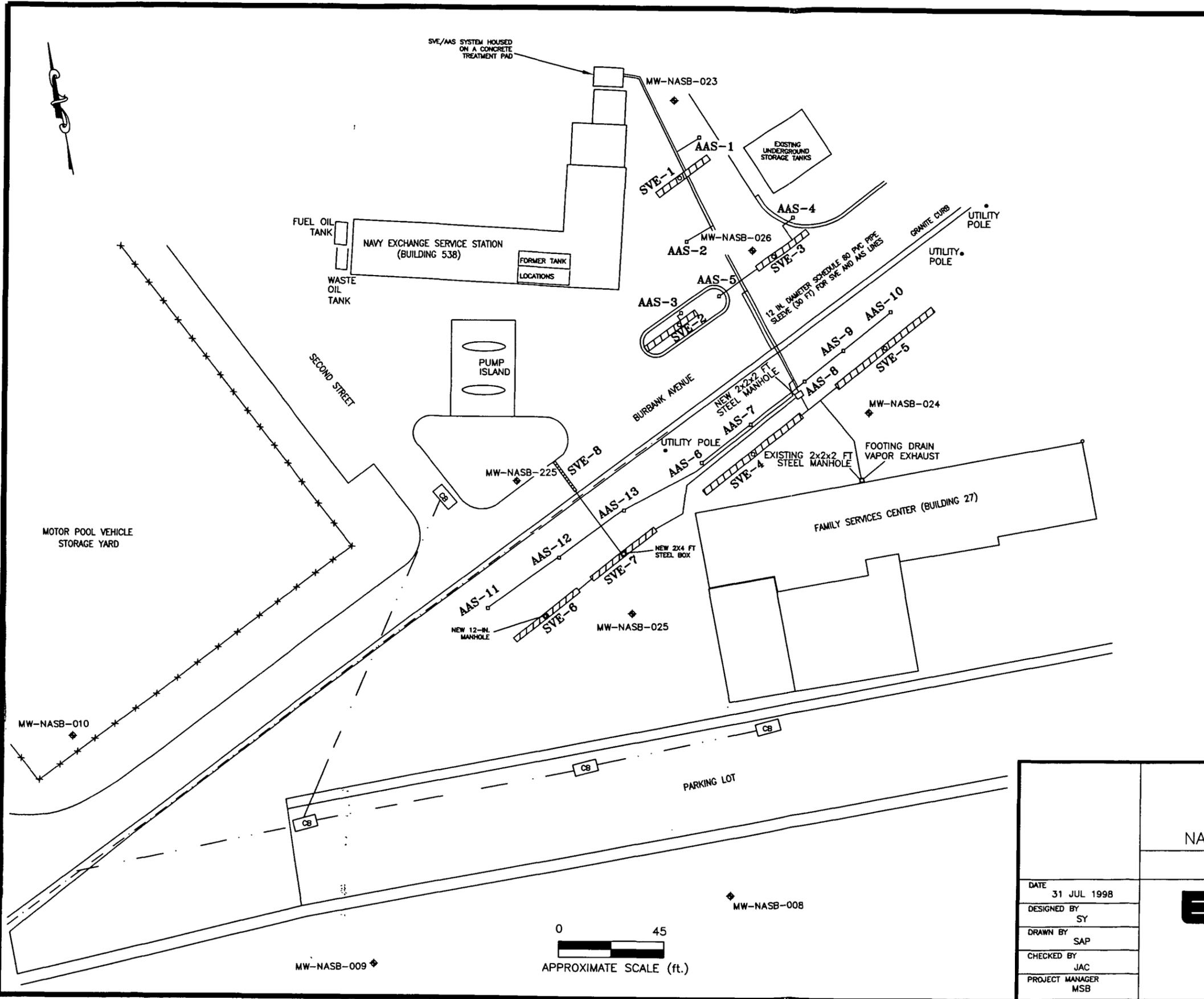
Sincerely yours,



John A. Carnright  
CTO Manager

JAC/caw  
Attachments

cc: L. Joy (NAS Brunswick)  
C. Sait (MEDEP)  
C. Flynn (EA)  
S. Chase (EA)



**LEGEND**

|  |                              |
|--|------------------------------|
|  | SOIL VAPOR EXTRACTION TRENCH |
|  | AQUIFER AIR SPARGING WELL    |
|  | MONITORING WELL              |
|  | ACCESS VAULT TO SVE TRENCH   |
|  | EXISTING CHAIN LINK FENCE    |
|  | UNDERGROUND STORM SEWER      |

DWG. FILE F:\CAD\29600\35\GWSEPP98.DWG

SITE PLAN SHOWING LAYOUT OF  
REMEDATION SYSTEM AS-BUILT  
NAVY EXCHANGE SERVICE STATION  
NAVAL AIR STATION, BRUNSWICK, MAINE

FIGURE 1

|                        |  |                            |
|------------------------|--|----------------------------|
| DATE<br>31 JUL 1998    | <p>EA ENGINEERING,<br/>SCIENCE, AND<br/>TECHNOLOGY</p> <p>3 WASHINGTON CENTER<br/>THE MAPLE BUILDING<br/>NEWBURGH, NEW YORK 12550<br/>(914) 565-8100</p> | PROJECT NUMBER<br>29600.35 |
| DESIGNED BY<br>SY      |  | SCALE<br>AS SHOWN          |
| DRAWN BY<br>SAP        |  | FILE NAME<br>GWJUN98       |
| CHECKED BY<br>JAC      |  | DRAWING NUMBER<br>-        |
| PROJECT MANAGER<br>MSB |  | SHEET NUMBER<br>1 OF 1     |



MW-NASB-009

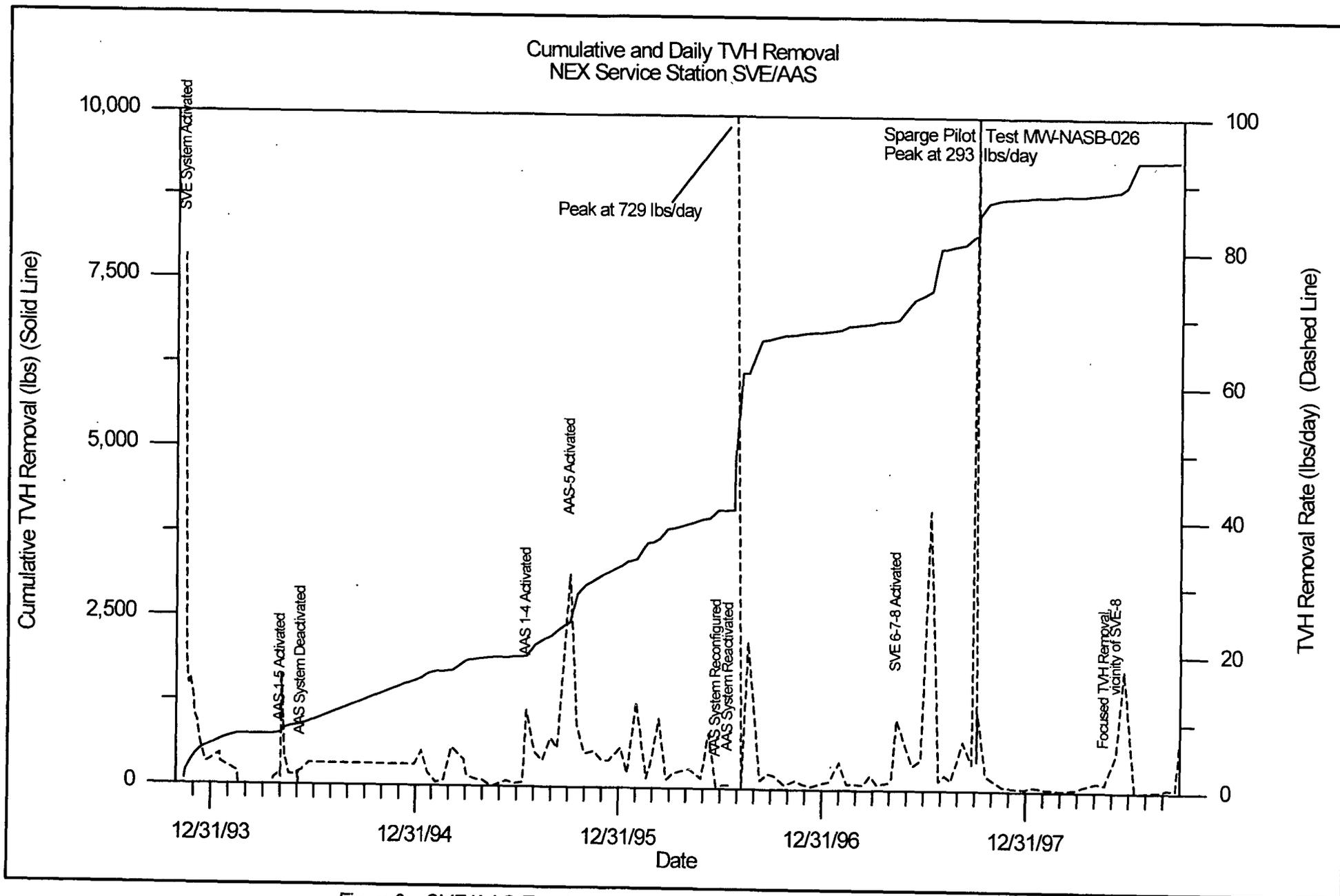
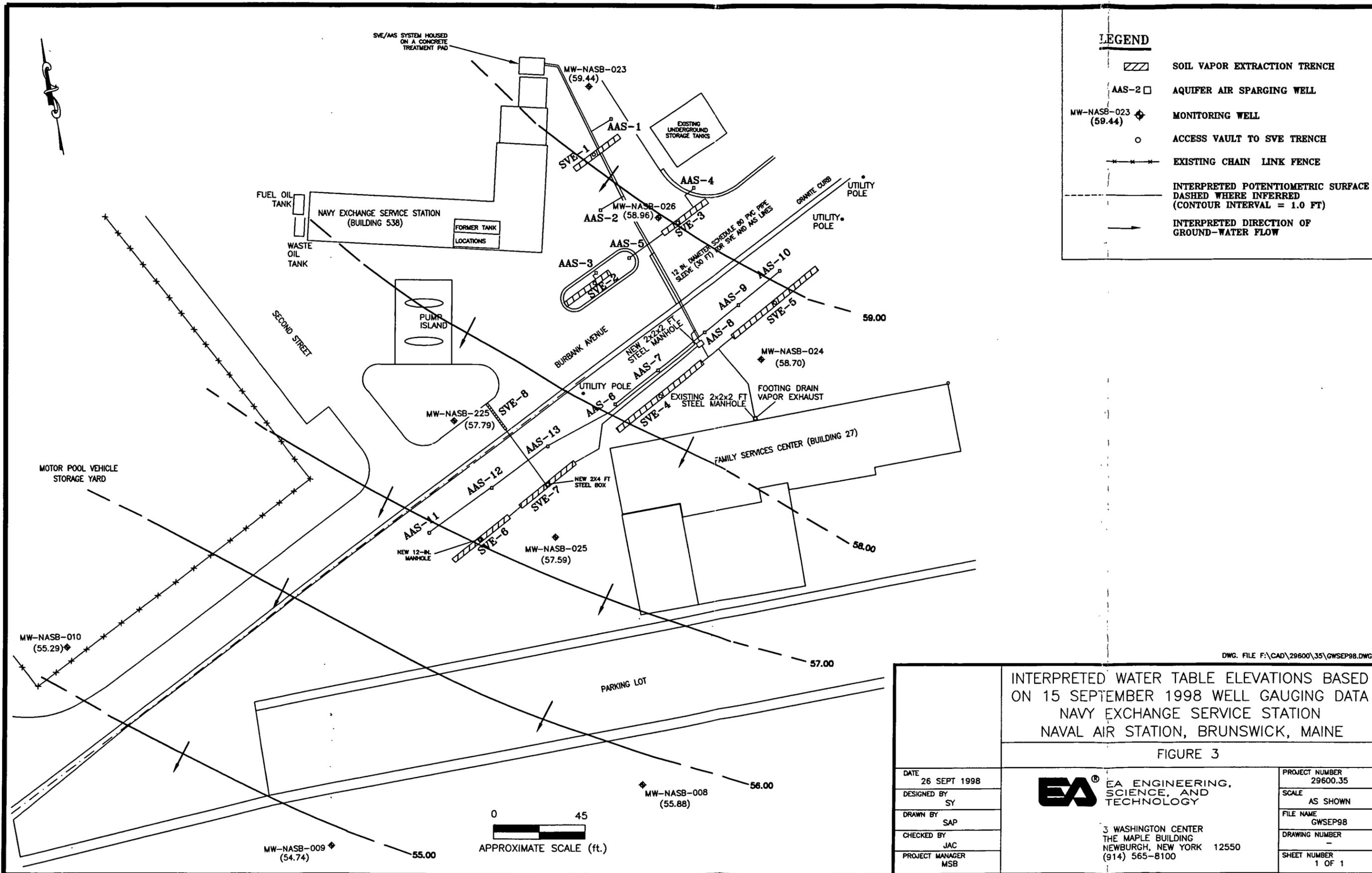


Figure 2. SVE/AAS Treatment system performance showing daily and cumulative Total Volatile Hydrocarbon removal.





**LEGEND**

- SOIL VAPOR EXTRACTION TRENCH
- AAS-2 □ AQUIFER AIR SPARGING WELL
- MW-NASB-023 (59.44) ◆ MONITORING WELL
- ACCESS VAULT TO SVE TRENCH
- x — x — EXISTING CHAIN LINK FENCE
- - - INTERPRETED POTENTIOMETRIC SURFACE DASHED WHERE INFERRED (CONTOUR INTERVAL = 1.0 FT)
- INTERPRETED DIRECTION OF GROUND-WATER FLOW

DWG. FILE F:\CAD\29600\35\GWSEP98.DWG

INTERPRETED WATER TABLE ELEVATIONS BASED ON 15 SEPTEMBER 1998 WELL GAUGING DATA  
 NAVY EXCHANGE SERVICE STATION  
 NAVAL AIR STATION, BRUNSWICK, MAINE

FIGURE 3

|                 |              |
|-----------------|--------------|
| DATE            | 26 SEPT 1998 |
| DESIGNED BY     | SY           |
| DRAWN BY        | SAP          |
| CHECKED BY      | JAC          |
| PROJECT MANAGER | MSB          |

**EA** ENGINEERING, SCIENCE, AND TECHNOLOGY

3 WASHINGTON CENTER  
 THE MAPLE BUILDING  
 NEWBURGH, NEW YORK 12550  
 (914) 565-8100

|                |          |
|----------------|----------|
| PROJECT NUMBER | 29600.35 |
| SCALE          | AS SHOWN |
| FILE NAME      | GWSEP98  |
| DRAWING NUMBER | -        |
| SHEET NUMBER   | 1 OF 1   |

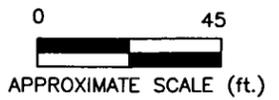


TABLE 1 SUMMARY OF SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE DATA  
 RECORDED FROM 13 JULY THROUGH 23 SEPTEMBER 1998  
 AT THE NAVY EXCHANGE SERVICE STATION (BUILDING 538)  
 NAVAL AIR STATION, BRUNSWICK, MAINE

| Sample Date  | System Status | Total Volatile Hydrocarbons (ppm <sub>v</sub> ) <sup>(a)</sup> | Vacuum at Treatment Plant (in. H <sub>2</sub> O) | Vacuum at Trench (in. H <sub>2</sub> O) | Flow Rate (cfm) | Daily Total Volatile Hydrocarbon Removal Rate <sup>(b)</sup> (lb/day) |
|--|---------------|--|--|---|-----------------|---|
| <b>SVE-3 INTAKE</b>  |               |  |  |   |                 |   |
| 13 JUL 1998  | SVE/AAS       | 8.3  | 10   | 6.0                                     | 45              | 0.13  |
| 22 JUL 1998  | SVE/AAS       | 0.0  | 10   | 5.0                                     | 50              | 0.00  |
| 06 AUG 1998  | SVE/AAS       | 4.6  | 10   | 5.0                                     | 60              | 0.10  |
| 25 AUG 1998  | SVE/AAS       | 3.8  | 11   | 3.0                                     | 60              | 0.08  |
| 08 SEP 1998  | SVE/AAS       | 5.0  | 10   | 3.0                                     | 65              | 0.11  |
| 23 SEP 1998  | SVE/AAS       | 9.4  | 10   | 3.0                                     | 70              | 2.30  |
| <b>SVE-4 INTAKE</b>  |               |  |  |   |                 |   |
| 13 JUL 1998  | SVE/AAS       | 0.9  | 5  | 2.5                                     | 85              | 0.03  |
| 22 JUL 1998  | SVE/AAS       | 0.0  | 5  | 2.5                                     | 85              | 0.00  |
| 06 AUG 1998  | SVE/AAS       | 1.9  | 5  | 3.0                                     | 85              | 0.06  |
| 25 AUG 1998  | SVE/AAS       | 1.6  | 5  | 2.0                                     | 90              | 0.05  |
| 08 SEP 1998  | SVE/AAS       | 2.5  | 5  | 2.0                                     | 85              | 0.07  |
| 23 SEP 1998  | SVE/AAS       | 20.0   | 5  | 2.0                                     | 85              | 0.59  |
| <b>SVE-5, SVE-6, SVE-7, AND SVE-8 COMPOSITE INTAKE</b>   |               |  |  |   |                 |   |
| 13 JUL 1998  | SVE/AAS       | 5.1  | 22   | No data                                 | 130             | 0.23  |
| 22 JUL 1998  | SVE/AAS       | 0.0  | 20   | No data                                 | 130             | 0.00  |
| 06 AUG 1998  | SVE/AAS       | 2.3  | 22   | 8                                       | 130             | 0.10  |
| 25 AUG 1998  | SVE/AAS       | 1.3  | 22   | 6                                       | 130             | 0.06  |
| 08 SEP 1998  | SVE/AAS       | 3.5  | 21   | 5.5                                     | 130             | 0.16  |
| 23 SEP 1998  | SVE/AAS       | 19.0   | 22   | 5.5                                     | 130             | 0.86  |
| <b>SVE COMPOSITE INTAKE</b>  |               |  |  |   |                 |   |
| 13 JUL 1998  | SVE/AAS       | 1.9  | 84   | NA                                      | 260             | 0.17  |
| 22 JUL 1998  | SVE/AAS       | 0.0  | 84   | NA                                      | 265             | 0.00  |
| 06 AUG 1998  | SVE/AAS       | 2.1  | 86   | NA                                      | 275             | 0.20  |
| 25 AUG 1998  | SVE/AAS       | 2.2  | 84   | NA                                      | 280             | 0.22  |
| 08 SEP 1998  | SVE/AAS       | 5.5  | 84   | NA                                      | 280             | 0.54  |
| 23 SEP 1998  | SVE/AAS       | 4.5  | 85   | NA                                      | 285             | 0.44  |
| <b>SVE COMPOSITE EMISSIONS</b>   |               |  |  |   |                 |   |
| 13 JUL 1998  | SVE/AAS       | 2.5  | NA   | NA                                      | 260             | 0.23  |
| 22 JUL 1998  | SVE/AAS       | 0.0  | NA   | NA                                      | 265             | 0.00  |
| 06 AUG 1998  | SVE/AAS       | 1.1  | NA   | NA                                      | 275             | 0.11  |
| 25 AUG 1998  | SVE/AAS       | 1.0  | NA   | NA                                      | 280             | 0.10  |
| 08 SEP 1998  | SVE/AAS       | 3.0  | NA   | NA                                      | 280             | 0.29  |
| 23 SEP 1998  | SVE/AAS       | 2.5  | NA   | NA                                      | 285             | 0.25  |
| <p>(a) Based on measurements taken with photoionization detector. Photoionization detector measurements considered a conservative approximation of total volatile hydrocarbon concentrations at sample location due to instrument response limitations.</p> <p>(b) Loading rate calculated using formula provided by EPA (1989): <math>ER = Q \times C \times MW \times 1.58 \times 10^{-7} \times 24</math>, where: ER = Emissions rate (lb/day), Q = Flow rate (cfm), C = Total volatile hydrocarbon concentration in influent (ppm<sub>v</sub>), MW = Molecular weight (average) of vapor phase weathered gasoline (92.14 g/mole).</p> <p>NOTE: cfm = Cubic feet per minute.<br/>                 SVE/AAS = Soil vapor extraction/aquifer air sparging.<br/>                 NA = Not applicable.<br/>                 SVE composite removal (flow) rate taken as summation of flow rates of individual SVE trench lines.<br/>                 SVE-1 and SVE-2 offline during reporting period.</p> |               |  |  |   |                 |   |

TABLE 2 SUMMARY OF WELL GAUGING DATA  
 RECORDED FROM 13 JULY THROUGH 23 SEPTEMBER 1998  
 AT THE NAVY EXCHANGE SERVICE STATION (BUILDING 538)  
 NAVAL AIR STATION, BRUNSWICK, MAINE

| Gauging Date   | Well Elevation<br>(ft MSL) | Depth to<br>Water (ft) | Depth to<br>LNAPL (ft) | LNAPL<br>Thickness (ft) | Water Table<br>Elevation (ft MSL) |
|--|----------------------------|------------------------|------------------------|-------------------------|-----------------------------------|
| <b>MW-NASB-023</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 67.29                      | 7.18                   | ---                    | ---                     | 60.11                             |
| 22 JUL 1998  | 67.29                      | 7.43                   | ---                    | ---                     | 59.86                             |
| 06 AUG 1998  | 67.29                      | 7.67                   | ---                    | ---                     | 59.62                             |
| 25 AUG 1998  | 67.29                      | 7.57                   | ---                    | ---                     | 59.72                             |
| 08 SEP 1998  | 67.29                      | 7.65                   | ---                    | ---                     | 59.64                             |
| 23 SEP 1998  | 67.29                      | 7.88                   | ---                    | ---                     | 59.41                             |
| <b>MW-NASB-024</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 65.31                      | 5.82                   | ---                    | ---                     | 59.49                             |
| 22 JUL 1998  | 65.31                      | 5.99                   | ---                    | ---                     | 59.32                             |
| 06 AUG 1998  | 65.31                      | 6.38                   | ---                    | ---                     | 58.93                             |
| 25 AUG 1998  | 65.31                      | 6.54                   | ---                    | ---                     | 58.77                             |
| 08 SEP 1998  | 65.31                      | 6.63                   | ---                    | ---                     | 58.68                             |
| 23 SEP 1998  | 65.31                      | 6.77                   | ---                    | ---                     | 58.54                             |
| <b>MW-NASB-025</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 64.34                      | 6.72                   | ---                    | ---                     | 57.62                             |
| 22 JUL 1998  | 64.34                      | 6.81                   | ---                    | ---                     | 57.53                             |
| 06 AUG 1998  | 64.34                      | 6.91                   | ---                    | ---                     | 57.43                             |
| 25 AUG 1998  | 64.34                      | 6.29                   | ---                    | ---                     | 58.05                             |
| 08 SEP 1998  | 64.34                      | 6.84                   | ---                    | ---                     | 57.50                             |
| 23 SEP 1998  | 64.34                      | 6.99                   | ---                    | ---                     | 57.35                             |
| <b>MW-NASB-026</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 66.61                      | 6.95                   | ---                    | ---                     | 59.66                             |
| 22 JUL 1998  | 66.61                      | 7.18                   | ---                    | ---                     | 59.43                             |
| 06 AUG 1998  | 66.61                      | 7.42                   | ---                    | ---                     | 59.19                             |
| 25 AUG 1998  | 66.61                      | 7.29                   | ---                    | ---                     | 59.32                             |
| 08 SEP 1998  | 66.61                      | 7.39                   | ---                    | ---                     | 59.22                             |
| 23 SEP 1998  | 66.61                      | 7.61                   | ---                    | ---                     | 59.00                             |
| <b>MW-NASB-008</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 59.22                      | 2.99                   | ---                    | ---                     | 56.23                             |
| 22 JUL 1998  | 59.22                      | 3.30                   | ---                    | ---                     | 55.92                             |
| 06 AUG 1998  | 59.22                      | 3.49                   | ---                    | ---                     | 55.73                             |
| 25 AUG 1998  | 59.22                      | 3.17                   | ---                    | ---                     | 56.05                             |
| 08 SEP 1998  | 59.22                      | 3.38                   | ---                    | ---                     | 55.84                             |
| 23 SEP 1998  | 59.22                      | 3.54                   | ---                    | ---                     | 55.68                             |
| <b>MW-NASB-009</b>   |                            |                        |                        |                         |                                   |
| 13 JUL 1998  | 59.00                      | 4.05                   | ---                    | ---                     | 54.95                             |
| 22 JUL 1998  | 59.00                      | 4.21                   | ---                    | ---                     | 54.79                             |
| 06 AUG 1998  | 59.00                      | 4.38                   | ---                    | ---                     | 54.62                             |
| 25 AUG 1998  | 59.00                      | 4.24                   | ---                    | ---                     | 54.76                             |
| 08 SEP 1998  | 59.00                      | 4.26                   | ---                    | ---                     | 54.74                             |
| 23 SEP 1998  | 59.00                      | 4.30                   | ---                    | ---                     | 54.70                             |
| NOTE: MSL = Mean sea level.  |                            |                        |                        |                         |                                   |
| LNAPL = Light, non-aqueous phase liquid.   |                            |                        |                        |                         |                                   |
| Dashes (---) indicate LNAPL not detected in well.  |                            |                        |                        |                         |                                   |
| Depth to water measurements recorded from marker on top of polyvinyl chloride well riser.  |                            |                        |                        |                         |                                   |
| Sparge wells AAS-3 through AAS-7 and AAS-11 through AAS-13 were not gauged because of the presence of sparge well manifolds atop the well heads and active sparging. |                            |                        |                        |                         |                                   |

TABLE 2 (Continued)

| Gauging Date              | Well Elevation<br>(ft MSL) | Depth to<br>Water (ft) | Depth to<br>LNAPL (ft) | LNAPL<br>Thickness (ft) | Water Table<br>Elevation (ft MSL) |
|---------------------------|----------------------------|------------------------|------------------------|-------------------------|-----------------------------------|
| <b>MW-NASB-010</b>        |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 62.03                      | 6.67                   | ---                    | ---                     | 55.36                             |
| 22 JUL 1998               | 62.03                      | 6.77                   | ---                    | ---                     | 55.26                             |
| 06 AUG 1998               | 62.03                      | 6.85                   | ---                    | ---                     | 55.18                             |
| 25 AUG 1998               | 62.03                      | 6.75                   | ---                    | ---                     | 55.28                             |
| 08 SEP 1998               | 62.03                      | 6.75                   | ---                    | ---                     | 55.28                             |
| 23 SEP 1998               | 62.03                      | 6.83                   | ---                    | ---                     | 55.20                             |
| <b>MW-NASB-225</b>        |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 64.61                      | 6.50                   | ---                    | ---                     | 58.11                             |
| 22 JUL 1998               | 64.61                      | 6.65                   | ---                    | ---                     | 57.96                             |
| 06 AUG 1998               | 64.61                      | 6.75                   | ---                    | ---                     | 57.86                             |
| 25 AUG 1998               | 64.61                      | 6.56                   | ---                    | ---                     | 58.05                             |
| 08 SEP 1998               | 64.61                      | 6.74                   | ---                    | ---                     | 57.87                             |
| 23 SEP 1998               | 64.61                      | 6.84                   | ---                    | ---                     | 57.77                             |
| <b>Sparge Well AAS-1</b>  |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 66.89                      | 6.98                   | ---                    | ---                     | 59.91                             |
| 22 JUL 1998               | 66.89                      | 7.20                   | ---                    | ---                     | 59.69                             |
| 06 AUG 1998               | 66.89                      | 7.42                   | ---                    | ---                     | 59.47                             |
| 25 AUG 1998               | 66.89                      | 7.30                   | ---                    | ---                     | 59.59                             |
| 08 SEP 1998               | 66.89                      | 7.39                   | ---                    | ---                     | 59.50                             |
| 23 SEP 1998               | 66.89                      | 7.59                   | ---                    | ---                     | 59.30                             |
| <b>Sparge Well AAS-2</b>  |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 65.96                      | 6.47                   | ---                    | ---                     | 59.49                             |
| 22 JUL 1998               | 65.96                      | 6.71                   | ---                    | ---                     | 59.25                             |
| 06 AUG 1998               | 65.96                      | 6.89                   | ---                    | ---                     | 59.07                             |
| 25 AUG 1998               | 65.96                      | 6.73                   | ---                    | ---                     | 59.23                             |
| 08 SEP 1998               | 65.96                      | 6.88                   | ---                    | ---                     | 59.08                             |
| 23 SEP 1998               | 65.96                      | 7.06                   | ---                    | ---                     | 58.90                             |
| <b>Sparge Well AAS-8</b>  |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 65.65                      | 6.60                   | ---                    | ---                     | 59.05                             |
| 22 JUL 1998               | 65.65                      | 6.76                   | ---                    | ---                     | 58.89                             |
| 06 AUG 1998               | 65.65                      | 7.01                   | ---                    | ---                     | 58.64                             |
| 25 AUG 1998               | 65.65                      | 6.94                   | ---                    | ---                     | 58.71                             |
| 08 SEP 1998               | 65.65                      | 7.11                   | ---                    | ---                     | 58.54                             |
| 23 SEP 1998               | 65.65                      | 7.21                   | ---                    | ---                     | 58.44                             |
| <b>Sparge Well AAS-9</b>  |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| 22 JUL 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| 06 AUG 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| 25 AUG 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| 08 SEP 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| 23 SEP 1998               | 65.98                      | Dry                    | ---                    | ---                     | ---                               |
| <b>Sparge Well AAS-10</b> |                            |                        |                        |                         |                                   |
| 13 JUL 1998               | 66.26                      | 6.00                   | ---                    | ---                     | 60.26                             |
| 22 JUL 1998               | 66.26                      | 6.21                   | ---                    | ---                     | 60.05                             |
| 06 AUG 1998               | 66.26                      | 6.62                   | ---                    | ---                     | 59.64                             |
| 25 AUG 1998               | 66.26                      | 6.86                   | ---                    | ---                     | 59.40                             |
| 08 SEP 1998               | 66.26                      | 6.95                   | ---                    | ---                     | 59.31                             |
| 23 SEP 1998               | 66.26                      | 7.01                   | ---                    | ---                     | 59.25                             |

TABLE 3 SUMMARY OF WATER QUALITY INDICATOR PARAMETERS  
 RECORDED FROM 13 JULY THROUGH 23 SEPTEMBER 1998  
 AT THE NAVY EXCHANGE SERVICE STATION (BUILDING 538)  
 NAVAL AIR STATION, BRUNSWICK, MAINE

| Monitoring Date    | pH   | Temperature<br>(°C) | Dissolved<br>Oxygen (mg/L) | Specific Conductivity<br>(μmhos/cm) | Redox<br>(mV) |
|--------------------|------|---------------------|----------------------------|-------------------------------------|---------------|
| <b>MW-NASB-023</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 7.29 | 17.00               | 7.33                       | 192                                 | 21            |
| 22 JUL 1998        | 7.64 | 16.58               | 7.12                       | 193                                 | 189           |
| 06 AUG 1998        | 8.24 | 19.97               | 6.13                       | 181                                 | 169           |
| 25 AUG 1998        | 7.27 | 15.32               | 3.11                       | 153                                 | 275           |
| 08 SEP 1998        | 7.31 | 18.31               | 7.68                       | 176                                 | 253           |
| 23 SEP 1998        | 7.81 | 18.32               | 5.88                       | 204                                 | 220           |
| <b>MW-NASB-024</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 6.72 | 12.52               | 7.86                       | 75                                  | 39            |
| 22 JUL 1998        | 7.23 | 11.20               | 2.29                       | 118                                 | 186           |
| 06 AUG 1998        | 8.05 | 15.48               | 5.93                       | 97                                  | 168           |
| 25 AUG 1998        | 6.62 | 13.33               | 2.82                       | 108                                 | 262           |
| 08 SEP 1998        | 6.40 | 12.37               | 1.66                       | 183                                 | 132           |
| 23 SEP 1998        | 7.11 | 15.11               | 5.36                       | 107                                 | 118           |
| <b>MW-NASB-025</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 6.91 | 13.26               | 7.30                       | 134                                 | 50            |
| 22 JUL 1998        | 7.20 | 11.65               | 4.28                       | 291                                 | 182           |
| 06 AUG 1998        | 7.73 | 22.13               | 5.26                       | 223                                 | 160           |
| 25 AUG 1998        | 6.53 | 13.95               | 1.69                       | 290                                 | 239           |
| 08 SEP 1998        | 6.34 | 15.92               | 1.66                       | 204                                 | 111           |
| 23 SEP 1998        | 6.68 | 14.37               | 2.58                       | 430                                 | 84            |
| <b>MW-NASB-026</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 6.61 | 14.70               | 4.71                       | 519                                 | 80            |
| 22 JUL 1998        | 7.08 | 13.31               | 4.94                       | 516                                 | 218           |
| 06 AUG 1998        | 7.93 | 19.14               | 6.74                       | 454                                 | 191           |
| 25 AUG 1998        | 6.55 | 14.90               | 0.61                       | 481                                 | 302           |
| 08 SEP 1998        | 6.38 | 17.52               | 4.06                       | 429                                 | 213           |
| 23 SEP 1998        | 6.75 | 15.92               | 1.82                       | 458                                 | 109           |
| <b>MW-NASB-008</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 6.52 | 14.76               | 4.25                       | 263                                 | 74            |
| 22 JUL 1998        | 7.14 | 15.49               | 2.46                       | 256                                 | 183           |
| 06 AUG 1998        | 7.41 | 16.66               | 2.49                       | 255                                 | 189           |
| 25 AUG 1998        | 6.48 | 13.80               | 2.08                       | 307                                 | 248           |
| 08 SEP 1998        | 6.20 | 14.61               | 4.01                       | 335                                 | 140           |
| 23 SEP 1998        | 6.71 | 12.82               | 3.15                       | 293                                 | 112           |
| <b>MW-NASB-009</b> |      |                     |                            |                                     |               |
| 13 JUL 1998        | 6.68 | 14.05               | 3.00                       | 166                                 | 74            |
| 22 JUL 1998        | 7.22 | 15.91               | 4.62                       | 176                                 | 177           |
| 06 AUG 1998        | 7.42 | 16.78               | 2.63                       | 238                                 | 186           |
| 25 AUG 1998        | 6.64 | 16.05               | 2.49                       | 242                                 | 245           |
| 08 SEP 1998        | 6.38 | 17.20               | 5.07                       | 252                                 | 146           |
| 23 SEP 1998        | 6.52 | 13.73               | 2.33                       | 281                                 | 95            |

TABLE 3 (Continued)

| Monitoring Date           | pH                          | Temperature (°C) | Dissolved Oxygen (mg/L) | Specific Conductivity (μmhos/cm) | Redox (mV) |
|---------------------------|-----------------------------|------------------|-------------------------|----------------------------------|------------|
| <b>MW-NASB-010</b>        |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 6.62                        | 13.78            | 3.07                    | 192                              | 42         |
| 22 JUL 1998               | 7.29                        | 14.15            | 3.87                    | 187                              | 50         |
| 06 AUG 1998               | 7.51                        | 15.98            | 4.80                    | 193                              | 123        |
| 25 AUG 1998               | 6.74                        | 15.47            | 2.12                    | 212                              | 239        |
| 08 SEP 1998               | 6.42                        | 17.91            | 6.04                    | 181                              | 160        |
| 23 SEP 1998               | 6.65                        | 13.20            | 3.96                    | 223                              | 56         |
| <b>MW-NASB-225</b>        |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 6.45                        | 14.66            | 4.33                    | 258                              | 75         |
| 22 JUL 1998               | 7.05                        | 15.09            | 3.64                    | 260                              | 163        |
| 06 AUG 1998               | 7.37                        | 16.81            | 5.34                    | 251                              | 181        |
| 25 AUG 1998               | 6.43                        | 17.03            | 1.93                    | 291                              | 254        |
| 08 SEP 1998               | 6.20                        | 15.97            | 3.73                    | 297                              | 166        |
| 23 SEP 1998               | 6.45                        | 15.79            | 2.61                    | 258                              | 43         |
| <b>Sparge Well AAS-1</b>  |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 7.22                        | 16.83            | 7.07                    | 97                               | 36         |
| 22 JUL 1998               | 7.55                        | 16.18            | 7.41                    | 101                              | 188        |
| 06 AUG 1998               | 8.15                        | 20.03            | 7.20                    | 110                              | 166        |
| 25 AUG 1998               | 6.91                        | 19.17            | 5.13                    | 107                              | 292        |
| 08 SEP 1998               | 7.27                        | 18.57            | 8.13                    | 109                              | 256        |
| 23 SEP 1998               | 7.57                        | 18.47            | 5.28                    | 101                              | 222        |
| <b>Sparge Well AAS-2</b>  |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 6.86                        | 15.83            | 2.45                    | 344                              | 60         |
| 22 JUL 1998               | 7.57                        | 13.86            | 3.79                    | 826                              | 203        |
| 06 AUG 1998               | 7.94                        | 20.31            | 7.00                    | 382                              | 183        |
| 25 AUG 1998               | 6.72                        | 18.05            | 2.15                    | 469                              | 306        |
| 08 SEP 1998               | 6.68                        | 16.02            | 5.11                    | 631                              | 267        |
| 23 SEP 1998               | 7.01                        | 18.12            | 3.02                    | 536                              | 245        |
| <b>Sparge Well AAS-8</b>  |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 6.57                        | 13.43            | 5.88                    | 167                              | 53         |
| 22 JUL 1998               | 7.27                        | 14.23            | 5.71                    | 196                              | 186        |
| 06 AUG 1998               | 7.95                        | 15.75            | 5.99                    | 213                              | 172        |
| 25 AUG 1998               | 6.46                        | 15.66            | 1.43                    | 226                              | 246        |
| 08 SEP 1998               | 6.44                        | 15.57            | 1.39                    | 232                              | 107        |
| 23 SEP 1998               | 6.93                        | 15.69            | 1.74                    | 216                              | 84         |
| <b>Sparge Well AAS-9</b>  |                             |                  |                         |                                  |            |
| 13 JUL 1998               | Well dry; no data           |                  |                         |                                  |            |
| 22 JUL 1998               | Well dry; no data           |                  |                         |                                  |            |
| 06 AUG 1998               | Well dry; no data           |                  |                         |                                  |            |
| 25 AUG 1998               | Well dry; no data           |                  |                         |                                  |            |
| 08 SEP 1998               | Well dry; no data           |                  |                         |                                  |            |
| 23 SEP 1998               | Well dry; no data           |                  |                         |                                  |            |
| <b>Sparge Well AAS-10</b> |                             |                  |                         |                                  |            |
| 13 JUL 1998               | 7.09                        | 14.18            | 4.95                    | 91                               | 35         |
| 22 JUL 1998               | 7.35                        | 14.92            | 1.98                    | 125                              | 190        |
| 06 AUG 1998               | 8.09                        | 16.15            | 5.51                    | 121                              | 167        |
| 25 AUG 1998               | 6.80                        | 16.32            | 1.55                    | 135                              | 268        |
| 08 SEP 1998               | 6.65                        | 16.20            | 2.28                    | 139                              | 151        |
| 23 SEP 1998               | Insufficient water; no data |                  |                         |                                  |            |

**TABLE 4 SUMMARY OF ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES  
COLLECTED FROM 20 MAY 1992 TO 15 SEPTEMBER 1998 AT THE  
NAVY EXCHANGE SERVICE STATION (BUILDING 538)  
NAVAL AIR STATION, BRUNSWICK, MAINE**

| Date  | Parameters             |         |                   |                  |               |                     |                            |                            |
|---|------------------------|---------|-------------------|------------------|---------------|---------------------|----------------------------|----------------------------|
|   | Benzene <sup>(a)</sup> | Toluene | Ethyl-<br>benzene | Total<br>Xylenes | Total<br>BTEX | MTBE <sup>(b)</sup> | TPH-<br>GRO <sup>(c)</sup> | TPH-<br>DRO <sup>(c)</sup> |
| MEDEP Stringent<br>Cleanup Standard <sup>(a)</sup>  | 5                      | ---     | ---               | ---              | ---           | 35                  | 50                         | 50                         |
| <b>MW-NASB-023</b>  |                        |         |                   |                  |               |                     |                            |                            |
| 20 MAY 1992   | <1.0U                  | <1.0U   | <1.0U             | <2.0U            | ND            | <2.0U               | <20U                       | <10U                       |
| 13 JUL 1993   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <100U                      | <500U                      |
| 12-13 APR 1994  | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <100U                      | <50U                       |
| 7-8 JUL 1994  | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U                       | <50U                       |
| 8-9 MAR 1995  | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U                       | <50U                       |
| 13 JUN 1995   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U                       | <50U                       |
| 14 SEP 1995   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <100U                      | <50U                       |
| 13 DEC 1995   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <100U                      | <50U                       |
| 12 MAR 1996   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U                       | 53 <sup>(d)</sup>          |
| 11 JUN 1996   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U                       | 410                        |
| 19 SEP 1996   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | <250U                      |
| 16 DEC 1996   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | NA                         |
| 20 MAR 1997   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <1.0U                      | 71                         |
| 04 JUN 1997   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <50U <sup>(e)</sup>        | 68                         |
| 16 SEP 1997   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | 74                         |
| 10 DEC 1997   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | <50U                       |
| 16 MAR 1998   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | 66                         |
| 10-11 JUN 1998  | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <10U                       | <50U                       |
| 15 SEP 1998   | <1.0U                  | <1.0U   | <1.0U             | <1.0U            | ND            | <1.0U               | <12U                       | <50U                       |
| <p>(a) Stringent cleanup goals taken from <i>Procedural Guidelines for Establishing Standards for the Remediation of Oil Contaminated Soil and Ground Water in Maine</i>, Maine Department of Environmental Protection, 1995. Dashes indicate no goal established for this compound.</p> <p>(b) Maine State Legislature, Office of Policy and Legal Analysis. Memo dated 3 June 1998 addressed to members of the Natural Resources Committee and Health and Human Services Committee.</p> <p>(c) Refer to previous reports for interpretive discussion regarding chromatographic fingerprints for these analyses.</p> <p>(d) Analytical results for duplicate sample.</p> <p>(e) Reanalysis due to low surrogate recovery.</p> <p>NOTE: BTEX = Benzene, toluene, ethylbenzene, and total xylenes.<br/>           MTBE = Methyl tertiary-butyl ether.<br/>           TPH = Total petroleum hydrocarbons; GRO = Gasoline range organics; DRO = Diesel range organics.<br/>           ND = Not detected.<br/>           NA = Not analyzed; sample bottles broken during shipment to laboratory or sample results outside of quality control criteria.<br/>           (&lt;_U) = Compound not detected above method detection limit shown.<br/>           Results reported in <math>\mu\text{g/L}</math>.</p> |                        |         |                   |                  |               |                     |                            |                            |

TABLE 4 (Continued)

| Date   | Parameters             |         |                   |                  |               |                     |                            |                            |
|--|------------------------|---------|-------------------|------------------|---------------|---------------------|----------------------------|----------------------------|
|  | Benzene <sup>(a)</sup> | Toluene | Ethyl-<br>benzene | Total<br>Xylenes | Total<br>BTEX | MTBE <sup>(b)</sup> | TPH-<br>GRO <sup>(c)</sup> | TPH-<br>DRO <sup>(c)</sup> |
| MEDEP Stringent<br>Cleanup Standard <sup>(a)</sup> | 5                      | ---     | ---               | ---              | ---           | 35                  | 50                         | 50                         |
| <b>MW-NASB-024</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 20 MAY 1992  | (<1.0U)                | 1.1     | (<1.0U)           | 4.2              | 5.3           | (<2.0U)             | 35                         | <b>460</b>                 |
| 13 JUL 1993  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | (<500U)                    |
| 12-13 APR 1994                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>99</b>                  |
| 7-8 JUL 1994                                       | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>280</b>                 |
| 8-9 MAR 1995                                       | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>91</b>                  |
| 13 JUN 1995  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | (<50U)                     |
| 14 SEP 1995  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | (<50U)                     |
| 13 DEC 1995  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>51</b>                  |
| 13 MAR 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | (<50U)                     |
| 11 JUN 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>86</b>                  |
| 19 SEP 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | 2.3              | 2.3           | (<1.0U)             | (<10U)                     | (<250U)                    |
| 16 DEC 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | NA                         |
| 21 MAR 1997  | (<1.0U)                | 2.5     | (<1.0U)           | 2.0              | 4.5           | (<1.0U)             | (<10U)                     | <b>110<sup>(d)</sup></b>   |
| 04 JUN 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>230</b>                 |
| 16 SEP 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>82<sup>(d)</sup></b>    |
| 10 DEC 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | <b>470</b>                 | <b>84</b>                  |
| 16 MAR 1998  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>93</b>                  |
| 10-11 JUN 1998                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>72</b>                  |
| 15 SEP 1998  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | 13                         | (<50U)                     |
| <b>MW-NASB-025</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 20 MAY 1992  | <b>14.0</b>            | 18      | 4.8               | 23               | 59.8          | 2.5                 | (<20U)                     | <b>61</b>                  |
| 13 JUL 1993  | 2.0                    | (<1.0U) | (<1.0U)           | (<1.0U)          | 2.0           | 2.0                 | (<100U)                    | (<500U)                    |
| 12-13 APR 1994                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>100</b>                 |
| 7-8 JUL 1994                                       | 2.1                    | 3.0     | (<1.0U)           | 2.3              | 7.4           | 3.2                 | <b>51</b>                  | <b>110</b>                 |
| 8-9 MAR 1995                                       | 4.8                    | 2.3     | 6.1               | 12               | 25.2          | 7.3                 | <b>60</b>                  | <b>57</b>                  |
| 13 JUN 1995  | 1.2                    | 4.3     | 6.7               | 83               | 95.2          | 33                  | <b>150</b>                 | <b>87</b>                  |
| 14 SEP 1995  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 23                  | <b>130</b>                 | <b>110</b>                 |
| 14 DEC 1995  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>63</b>           | (<100U)                    | <b>56</b>                  |
| 12 MAR 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>54</b>           | (<50U)                     | (<50U)                     |
| 11 JUN 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>49</b>           | (<50U)                     | <b>570</b>                 |
| 19 SEP 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>130</b>          | <b>79</b>                  | (<250U)                    |
| 16 DEC 1996  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>87</b>           | <b>120</b>                 | NA                         |
| 21 MAR 1997  | (<1.0U)                | 1.2     | (<1.0U)           | 1.6              | 2.8           | 27                  | 17                         | <b>240</b>                 |
| 04 JUN 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 26                  | <b>54</b>                  | <b>99</b>                  |
| 16 SEP 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>100</b>          | <b>150</b>                 | <b>110</b>                 |
| 10 DEC 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>140</b>          | <b>320</b>                 | <b>98</b>                  |
| 16 MAR 1998  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>46</b>           | (<10U)                     | <b>54</b>                  |
| 10-11 JUN 1998                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | <b>44</b>           | (<10U)                     | <b>100</b>                 |
| 15 SEP 1998  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 32                  | 15                         | <b>64</b>                  |

TABLE 4 (Continued)

| Date   | Parameters   |         |                   |                  |               |                     |                            |                            |
|--|--|---------|-------------------|------------------|---------------|---------------------|----------------------------|----------------------------|
|  | Benzene <sup>(a)</sup>   | Toluene | Ethyl-<br>benzene | Total<br>Xylenes | Total<br>BTEX | MTBE <sup>(b)</sup> | TPH-<br>GRO <sup>(c)</sup> | TPH-<br>DRO <sup>(c)</sup> |
| MEDEP Stringent<br>Cleanup Standard <sup>(a)</sup> | 5  | ---     | ---               | ---              | ---           | 35                  | 50                         | 50                         |
| <b>MW-NASB-026</b>                                 |  |         |                   |                  |               |                     |                            |                            |
| 20 MAY 1992  | <b>1,000</b>   | 12,000  | 3,900             | 22,000           | 38,900        | (<2,000U)           | <b>210,000</b>             | <b>84,000</b>              |
| 13 JUL 1993  | <b>810</b>   | 5,900   | 110               | 690              | 7,510         | (<100.0U)           | <b>24,000</b>              | <b>15,000</b>              |
| 12-13 APR 1994                                     | 47   | 4,200   | 2,000             | 16,700           | 22,947        | <b>210</b>          | <b>3,500</b>               | <b>85,000</b>              |
| 7-8 JUL 1994                                       | <b>21</b>  | 4,300   | 2,900             | 24,800           | 38,031        | <b>81</b>           | <b>80,000</b>              | <b>13,000</b>              |
| 8-9 MAR 1995 <sup>(b)</sup>                        | <b>5.9</b>   | 690     | 1,000             | 9,000            | 10,696        | <b>120</b>          | <b>30,000</b>              | <b>4,300</b>               |
| 13 JUN 1995  | (<1.0U)  | 170     | 880               | 8,400            | 9,450         | <b>470</b>          | <b>32,000</b>              | <b>7,800</b>               |
| 14 SEP 1995  | <b>30</b>  | 180     | 1,000             | 8,100            | 9,310         | <b>50</b>           | <b>32,000</b>              | <b>6,900</b>               |
| 13 DEC 1995 <sup>(b)</sup>                         | (<10U)   | 89      | 1,500             | 11,500           | 13,089        | <b>400</b>          | <b>15,000</b>              | <b>6,100</b>               |
| 13 MAR 1996  | (<10U)   | 90      | 1,300             | 9,000            | 10,390        | <b>340</b>          | <b>40,000</b>              | <b>6,600</b>               |
| 11 JUN 1996  | (<5U)  | 12      | 410               | 2,940            | 3,462         | <b>92</b>           | <b>14,000</b>              | <b>3,100</b>               |
| 19 SEP 1996  | (<10U)   | 34      | 1,200             | 7,800            | 9,034         | (<10U)              | <b>28,000</b>              | <b>5,800</b>               |
| 16 DEC 1996  | (<5.0U)  | (<5.0U) | 310               | 2,270            | 2,580         | (<5.0U)             | <b>11,000</b>              | NA                         |
| 20 MAR 1997  | (<1.0U)  | 27      | 910               | 5,990            | 6,927         | <b>49</b>           | <b>16,000</b>              | <b>5,400</b>               |
| 04 JUN 1997 <sup>(b)</sup>                         | (<1.0U)  | 22      | 530               | 3,350            | 3,902         | <b>560</b>          | <b>23,000</b>              | <b>7,200</b>               |
| 16 SEP 1997 <sup>(b)</sup>                         | (<5.0U)  | 14      | 840               | 6,540            | 7,394         | (<5.0U)             | <b>18,000</b>              | <b>7,500</b>               |
| 10 DEC 1997  | <b>11</b>  | 22      | 620               | 3,370            | 4,012         | (<1.0U)             | <b>29,000</b>              | <b>7,300</b>               |
| 16 MAR 1998  | (<1.0U)  | (<1.0U) | 260               | 1,694            | 1,954         | <b>550</b>          | <b>10,000</b>              | <b>5,300</b>               |
| 10-11 JUN 1998                                     | <b>6</b>   | 6       | 320               | 1,710            | 2,042         | <b>430</b>          | <b>15,000</b>              | <b>3,800</b>               |
| 15 SEP 1998  | (<5.0U)  | 7       | 460               | 2,950            | 3,417         | (<5.0U)             | <b>1,200</b>               | <b>7,800</b>               |
| <b>MW-NASB-027</b>                                 |  |         |                   |                  |               |                     |                            |                            |
| 20 MAY 1992  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<2.0U)          | ND            | 5.9                 | <b>56</b>                  | <b>300</b>                 |
| 13 JUL 1993  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | (<500U)                    |
| 12-13 APR 1994                                     | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>53</b>                  |
| 7-8 JUL 1994                                       | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>150</b>                 |
| 8-9 MAR 1995                                       | (<1.0U)  | 1.4     | (<1.0U)           | 2.9              | 4.3           | (<1.0U)             | <b>1,600</b>               | (<50U)                     |
| 13 JUN 1995  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>62</b>                  |
| 14 SEP 1995  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>65</b>                  |
| 14 DEC 1995  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | NA                         |
| 12 MAR 1996  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | (<50U)                     |
| 11 JUN 1996  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>88</b>                  |
| 19 SEP 1996  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | (<250U)                    |
| 16 DEC 1996  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | NA                         |
| 21 MAR 1997  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>76</b>                  |
| 04 JUN 1997  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>91</b>                  |
| 16 SEP 1997  | (<1.0U)  | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>150</b>                 |
| 15 SEP 1998  | Well was abandoned during construction activities at Building 27 |         |                   |                  |               |                     |                            |                            |

TABLE 4 (Continued)

| Date   | Parameters             |         |                   |                  |               |                     |                            |                            |
|--|------------------------|---------|-------------------|------------------|---------------|---------------------|----------------------------|----------------------------|
|  | Benzene <sup>(a)</sup> | Toluene | Ethyl-<br>benzene | Total<br>Xylenes | Total<br>BTEX | MTBE <sup>(b)</sup> | TPH-<br>GRO <sup>(c)</sup> | TPH-<br>DRO <sup>(c)</sup> |
| MEDEP Stringent<br>Cleanup Standard <sup>(a)</sup> | 5                      | ---     | ---               | ---              | ---           | 35                  | 50                         | 50                         |
| <b>MW-NASB-225</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 20 MAR 1997  | (<1.0U)                | 17,000  | 2,400             | 13,600           | 33,000        | (<1.0U)             | <b>34,000</b>              | <b>4,500</b>               |
| 05 JUN 1997  | <b>35</b>              | 17,000  | 2,200             | 11,800           | 31,000        | (<1.0U)             | <b>64,000</b>              | <b>7,000</b>               |
| 16 SEP 1997  | (<1.0U)                | 5,300   | 1,100             | 6,000            | 12,400        | (<1.0U)             | <b>15,000</b>              | <b>4,600</b>               |
| 10 DEC 1997 <sup>(b)</sup>                         | (<1.0U)                | 9,200   | 1,600             | 8,600            | 19,400        | (<1.0U)             | <b>65,000</b>              | <b>6,000</b>               |
| 16 MAR 1998  | (<1.0U)                | 12,000  | 1,700             | 9,500            | 23,200        | (<1.0U)             | <b>25,000</b>              | <b>6,300</b>               |
| 10-11 JUN 1998 <sup>(b)</sup>                      | <b>9</b>               | 9,600   | 2,100             | 11,100           | 22,809        | (<1.0U)             | <b>30,000</b>              | <b>3,100</b>               |
| 15 SEP 1998  | (<10.0U)               | 13,000  | 2,500             | 13,100           | 28,600        | (<10.0U)            | <b>4,000</b>               | <b>6,600</b>               |
| <b>MW-NASB-008</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 12-13 APR 1994                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>91</b>                  |
| 7-8 JUL 1994                                       | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 3.6                 | (<50U)                     | <b>100</b>                 |
| 21 MAR 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 7.7                 | 12                         | <b>94<sup>(d)</sup></b>    |
| 10-11 JUN 1998                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 20                  | (<10U)                     | <b>70</b>                  |
| <b>MW-NASB-009</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 12-13 APR 1994                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | <b>120</b>                 | <b>170</b>                 |
| 7-8 JUL 1994                                       | (<1.0U)                | (<1.0U) | 1.1               | 1.7              | 2.4           | 4.9                 | <b>78</b>                  | <b>110</b>                 |
| 21 MAR 1997  | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | 16                  | 10                         | <b>650</b>                 |
| 10-11 JUN 1998                                     | (<1.0U)                | (<1.0U) | 23                | 15               | 38            | 8                   | <b>180</b>                 | <b>98</b>                  |
| <b>MW-NASB-010</b>                                 |                        |         |                   |                  |               |                     |                            |                            |
| 12-13 APR 1994                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<100U)                    | <b>600</b>                 |
| 7-8 JUL 1994                                       | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<50U)                     | <b>360</b>                 |
| 21 MAR 1997  | (<1.0U)                | (<1.0U) | 1.1               | 6.8              | 7.9           | (<1.0U)             | (<10U)                     | <b>420</b>                 |
| 10-11 JUN 1998                                     | (<1.0U)                | (<1.0U) | (<1.0U)           | (<1.0U)          | ND            | (<1.0U)             | (<10U)                     | <b>290</b>                 |

**Attachment A**

**Field Record of  
Soil Vapor Extraction  
and Aquifer Air Sparging  
System Operations**

























**Attachment B**

**Field Record of Well Gauging,  
Purging, and Sampling Forms**



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

|                                       |                                       |
|---------------------------------------|---------------------------------------|
| Site Name: <u>NEY Service Station</u> | Project Number: <u>29600-35</u>       |
| Well ID: <u>MW-NASB-023</u>           | Well Lock Status: <u>Locked</u>       |
| Well Condition: <u>GOOD</u>           | Weather: <u>Blowers off and on 75</u> |

|   |                               |
|---|-------------------------------|
| Gauge Date: <u>9/15/98</u>              | Gauge Time: <u>1050</u>       |
| Sounding Method: <u>SLOPE INDICATOR</u> | Measurement Ref: <u>TOC</u>   |
| Stick Up/Down (ft): <u>Down</u>         | Well Diameter (in.): <u>2</u> |

|                               |                                   |
|-------------------------------|-----------------------------------|
| Purge Date: <u>9/15/98</u>    | Purge Time: <u>1100</u>           |
| Purge Method: <u>LOW FLOW</u> | Field Personnel: <u>SAP/KS/SC</u> |
| Ambient Air VOCs (ppm): _____ | Well Mouth VOCs (ppm): _____      |

| WELL VOLUME                         |                                    |  |  |
|-------------------------------------|------------------------------------|--|--|
| A. Well Depth (ft): <u>21.90</u>    | D. Well Volume/ft (L): <u>0.16</u> |  |  |
| B. Depth to Water (ft): <u>7.85</u> | C. Well Volume (L): <u>7</u>       |  |  |
| E. Liquid Depth (ft) (A-B): _____   | E. Three Well Volumes (L): _____   |  |  |

| Parameter               | Beginning | 1     | 2                    | 3     | 4                    | 5     |
|-------------------------|-----------|-------|----------------------|-------|----------------------|-------|
| Time (min.)             | 1102      | 1107  | <del>1110</del> 1112 | 1115  | 1118                 | 1121  |
| Depth to Water (ft)     | 7.86      | 7.86  | 7.84                 | 7.86  | 7.86                 | 7.86  |
| Purge Rate (l/min)      | 0.2       | 0.1   | 0.1                  | 0.1   | 0.1                  | 0.1   |
| Volume Purged (L)       | 0.2       | 0.7   | 1.2                  | 1.9   | 2.8                  | 2.2   |
| pH                      | 5.39      | 5.60  | 5.63                 | 5.63  | 5.64                 | 5.63  |
| Temperature (°C)        | 18.85     | 20.19 | 20.04                | 20.66 | 21.42                | 21.97 |
| Conductivity (µmhos/cm) | 150       | 159   | 161                  | 161   | 165                  | 168   |
| Dissolved Oxygen (mg/L) | 12.11     | 6.92  | 7.81                 | 7.28  | <del>5.64</del> 6.48 | 6.48  |
| Turbidity (NTU)         | 25        | 4     | 3                    | 4     | 4                    | 4     |
| eH (mV)                 | 130       | 122   | 119                  | 119   | 113                  | 113   |

|   |   |
|---|---|
| Total Quantity of Water Removed (L): <u>3.0</u>   |   |
| Samplers: <u>SAP/KS/SC</u>  | Sampling Time (Start/End): <u>1132 - 1150 SAP</u> |
| Sampling Date: <u>9/15/98</u>   | Decontamination Fluids Used: <u>DI WATER</u>      |
| Sample Type: <u>Grab</u>  | Sample Preservatives: <u>HCL</u>                  |
| Sample Bottle IDs: <u>MW-NASB-01 MS/MSD</u>   |   |
| Sample Parameters: <u>VOC, TPH GRO, TPH DRO</u>   |   |
| Comments and Observations: <u>Containerize purge water and disposed of at treatment plant</u> |   |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING (OVERFLOW PAGE)

|  |                                   |                      |
|--|-----------------------------------|----------------------|
| Site Name: <u>ALFK Service Station</u> | Project Number: <u>29600.55</u>   | Date: <u>9/15/98</u> |
| Well ID: <u>11W-NASB-023</u>           | Field Personnel: <u>SAP/KJ/SC</u> |                      |

| Parameter               | 6     | 7     | 8     | 9 | 10 | 11 |
|-------------------------|-------|-------|-------|---|----|----|
| Time (min.)             | 1124  | 1127  | 1120  |   |    |    |
| Depth to Water (ft)     | 7.86  | 7.86  | 7.86  |   |    |    |
| Purge Rate (L/min)      | 0.1   | 0.1   | 0.1   |   |    |    |
| Volume Purged (L)       | 2.4   | 2.7   | 3.0   |   |    |    |
| pH                      | 5.63  | 5.63  | 5.63  |   |    |    |
| Temperature (°C)        | 22.15 | 22.20 | 22.21 |   |    |    |
| Conductivity (µmhos/cm) | 171   | 174   | 175   |   |    |    |
| Dissolved Oxygen (mg/L) | 4.26  | 5.99  | 5.91  |   |    |    |
| Turbidity (NTU)         | 5     | 6     | 7     |   |    |    |
| eH (mV)                 | 113   | 113   | 113   |   |    |    |

| Parameter               | 12 | 13 | 14 | 15 | 16 | 17 |
|-------------------------|----|----|----|----|----|----|
| Time (min.)             |    |    |    |    |    |    |
| Depth to Water (ft)     |    |    |    |    |    |    |
| Purge Rate (L/min)      |    |    |    |    |    |    |
| Volume Purged (L)       |    |    |    |    |    |    |
| pH                      |    |    |    |    |    |    |
| Temperature (°C)        |    |    |    |    |    |    |
| Conductivity (µmhos/cm) |    |    |    |    |    |    |
| Dissolved Oxygen (mg/L) |    |    |    |    |    |    |
| Turbidity (NTU)         |    |    |    |    |    |    |
| eH (mV)                 |    |    |    |    |    |    |

Comments and Observations: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

|                                       |                                 |
|---------------------------------------|---------------------------------|
| Site Name: <u>NEX SERVICE STATION</u> | Project Number: <u>29600.35</u> |
| Well ID: <u>MW-NASB-024</u>           | Well Lock Status: <u>locked</u> |
| Well Condition: <u>good</u>           | Weather: <u>overcast</u>        |

|   |                               |
|---|-------------------------------|
| Gauge Date: <u>9/15/98</u>              | Gauge Time: <u>1210</u>       |
| Sounding Method: <u>Slope Indicator</u> | Measurement Ref: <u>TOC</u>   |
| Stick Up/Down (ft): <u>Down</u>         | Well Diameter (in.): <u>2</u> |

|                                  |                                    |
|----------------------------------|------------------------------------|
| Purge Date: <u>9/15/98</u>       | Purge Time: <u>1218</u>            |
| Purge Method: <u>Low Flow</u>    | Field Personnel: <u>SC, KS, SP</u> |
| Ambient Air VOCs (ppm): <u>0</u> | Well Mouth VOCs (ppm): <u>0</u>    |

| WELL VOLUME                         |                                 |
|-------------------------------------|---------------------------------|
| A. Well Depth (ft): <u>13.15</u>    | D. Well Volume/ft (L): _____    |
| B. Depth to Water (ft): <u>6.61</u> | C. Well Volume (L) _____        |
| E. Liquid Depth (ft) (A-B) _____    | E. Three Well Volumes (L) _____ |

| Parameter               | Beginning | 1     | 2     | 3     | 4                   | 5     |
|-------------------------|-----------|-------|-------|-------|---------------------|-------|
| Time (min.)             | 1221      | 1224  | 1227  | 1230  | 1233 <sup>135</sup> | 1240  |
| Depth to Water (ft)     | 6.95      | 6.98  | 7.02  | 7.18  | 7.26                | 7.35  |
| Purge Rate (l/min)      | 0.1       | 0.1   | 0.1   | 0.1   | 0.1                 | 0.1   |
| Volume Purged (L)       | 0.3       | 0.6   | 0.9   | 1.2   | 1.7                 | 2.2   |
| pH                      | 5.57      | 6.63  | 6.92  | 6.75  | 6.52                | 6.48  |
| Temperature (°C)        | 16.57     | 16.58 | 17.14 | 17.84 | 18.43               | 19.00 |
| Conductivity (µmhos/cm) | 140       | 138   | 142   | 139   | 135                 | 132   |
| Dissolved Oxygen (mg/L) | 3.42      | 3.05  | 3.31  | 2.96  | 3.07                | 3.18  |
| Turbidity (NTU)         | 14        | 13    | 16    | 9     | 7                   | 9     |
| eH (mV)                 | 11        | 4     | -10   | -12   | -6                  | -3    |

|  |  |
|--|--|
| Total Quantity of Water Removed (L): <u>3.1</u>  |  |
| Samplers: <u>KG/SP</u>   | Sampling Time (Start/End): <u>1249</u>       |
| Sampling Date: <u>9/14/98</u>  | Decontamination Fluids Used: <u>DI Water</u> |
| Sample Type: <u>Grab</u>   | Sample Preservatives: <u>HCL</u>             |
| Sample Bottle IDs: <u>MW-NASB-02</u>   |  |
| Sample Parameters: <u>VOC TPH GRO TPH DRO</u>  |  |
| Comments and Observations: <u>Containerized purge water and disposed of at treatment plant</u> |  |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING (OVERFLOW PAGE)

|                                       |                                 |                      |
|---------------------------------------|---------------------------------|----------------------|
| Site Name: <u>NEX Service Station</u> | Project Number: <u>29600.35</u> | Date: <u>9/15/98</u> |
| Well ID: <u>MW-NASB-024</u>           | Field Personnel: <u>SAP/KS/</u> |                      |

| Parameter               | 6     | 7     | 8     | 9 | 10 | 11 |
|-------------------------|-------|-------|-------|---|----|----|
| Time (min.)             | 1243  | 1246  | 1249  |   |    |    |
| Depth to Water (ft)     | 7.35  | 7.35  | 7.35  |   |    |    |
| Purge Rate (L/min)      | 0.1   | 0.1   | 0.1   |   |    |    |
| Volume Purged (L)       | 2.5   | 2.8   | 3.1   |   |    |    |
| pH                      | 6.44  | 6.47  | 6.30  |   |    |    |
| Temperature (°C)        | 19.25 | 19.53 | 19.45 |   |    |    |
| Conductivity (µmhos/cm) | 131   | 129   | 128   |   |    |    |
| Dissolved Oxygen (mg/L) | 3.25  | 3.24  | 3.26  |   |    |    |
| Turbidity (NTU)         | 9.0   | 8     | 9     |   |    |    |
| eH (mV)                 | 3.    | 4     | 3     |   |    |    |

| Parameter               | 12 | 13 | 14 | 15 | 16 | 17 |
|-------------------------|----|----|----|----|----|----|
| Time (min.)             |    |    |    |    |    |    |
| Depth to Water (ft)     |    |    |    |    |    |    |
| Purge Rate (L/min)      |    |    |    |    |    |    |
| Volume Purged (L)       |    |    |    |    |    |    |
| pH                      |    |    |    |    |    |    |
| Temperature (°C)        |    |    |    |    |    |    |
| Conductivity (µmhos/cm) |    |    |    |    |    |    |
| Dissolved Oxygen (mg/L) |    |    |    |    |    |    |
| Turbidity (NTU)         |    |    |    |    |    |    |
| eH (mV)                 |    |    |    |    |    |    |

|                                  |
|----------------------------------|
| Comments and Observations: _____ |
|                                  |
|                                  |
|                                  |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

|                 |                            |                   |                     |
|-----------------|----------------------------|-------------------|---------------------|
| Site Name:      | <u>NEX Service Station</u> | Project Number:   | <u>29600.35</u>     |
| Well ID:        | <u>MW-NASB-025</u>         | Well Lock Status: | <u>locked</u>       |
| Well Condition: | <u>good</u>                | Weather:          | <u>drizzle ± 75</u> |

|                     |                        |                      |             |
|---------------------|------------------------|----------------------|-------------|
| Gauge Date:         | <u>9/15/98</u>         | Gauge Time:          | <u>1315</u> |
| Sounding Method:    | <u>Slope Indicator</u> | Measurement Ref:     | <u>ToC</u>  |
| Stick Up/Down (ft): | <u>Flush mount</u>     | Well Diameter (in.): | <u>2</u>    |

|                         |                 |                        |               |
|-------------------------|-----------------|------------------------|---------------|
| Purge Date:             | <u>9</u>        | Purge Time:            | <u>1315</u>   |
| Purge Method:           | <u>LOW FLOW</u> | Field Personnel:       | <u>KS/SAP</u> |
| Ambient Air VOCs (ppm): | <u>∅</u>        | Well Mouth VOCs (ppm): | <u>∅</u>      |

| WELL VOLUME                |              |                           |  |
|----------------------------|--------------|---------------------------|--|
| A. Well Depth (ft):        | <u>14.70</u> | D. Well Volume/ft (L):    |  |
| B. Depth to Water (ft):    | <u>6.75</u>  | C. Well Volume (L):       |  |
| E. Liquid Depth (ft) (A-B) |              | E. Three Well Volumes (L) |  |

| Parameter               | Beginning                  | 1            | 2            | 3            | 4            | 5            |
|-------------------------|----------------------------|--------------|--------------|--------------|--------------|--------------|
| Time (min.)             | <u>1320</u>                | <u>1323</u>  | <u>1326</u>  | <u>1329</u>  | <u>1331</u>  | <u>1333</u>  |
| Depth to Water (ft)     | <u>7.29</u><br><u>6.75</u> | <u>7.73</u>  | <u>8.02</u>  | <u>8.02</u>  | <u>8.38</u>  | <u>8.57</u>  |
| Purge Rate (l/min)      | <u>.2</u>                  | <u>.2</u>    | <u>.2</u>    | <u>.2</u>    | <u>.2</u>    | <u>.2</u>    |
| Volume Purged (L)       | <u>1.0</u>                 | <u>1.6</u>   | <u>2.2</u>   | <u>2.8</u>   | <u>3.4</u>   | <u>4.0</u>   |
| pH                      | <u>6.0</u>                 | <u>5.60</u>  | <u>6.51</u>  | <u>6.33</u>  | <u>6.38</u>  | <u>6.38</u>  |
| Temperature (°C)        | <u>15.97</u>               | <u>16.47</u> | <u>17.60</u> | <u>18.17</u> | <u>18.62</u> | <u>18.91</u> |
| Conductivity (µmhos/cm) | <u>399</u>                 | <u>409</u>   | <u>423</u>   | <u>429</u>   | <u>432</u>   | <u>425</u>   |
| Dissolved Oxygen (mg/L) | <u>3.07</u>                | <u>3.22</u>  | <u>3.26</u>  | <u>3.26</u>  | <u>3.33</u>  | <u>3.35</u>  |
| Turbidity (NTU)         | <u>42.7</u>                | <u>43.0</u>  | <u>32.0</u>  | <u>28.9</u>  | <u>26.4</u>  | <u>25.8</u>  |
| eH (mV)                 | <u>61.7</u>                | <u>62.3</u>  | <u>63.6</u>  | <u>65.9</u>  | <u>67.2</u>  | <u>68.7</u>  |

|  |                            |                              |             |
|--|----------------------------|------------------------------|-------------|
| Total Quantity of Water Removed (L):   |                            |                              |             |
| Samplers:  | <u>KS/SAP</u>              | Sampling Time (Start/End):   | <u>1358</u> |
| Sampling Date:   | <u>9/15/98</u>             | Decontamination Fluids Used: | <u>DI</u>   |
| Sample Type:   | <u>Grab</u>                | Sample Preservatives:        | <u>HCl</u>  |
| Sample Bottle IDs:   | <u>MW-NASB-03</u>          |                              |             |
| Sample Parameters:   | <u>VOC TPH 6RD TPH DRD</u> |                              |             |
| Comments and Observations: <u>Containerized purge water and disposed of at treatment plant</u> |                            |                              |             |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING (OVERFLOW PAGE)

|                                       |                                |                      |
|---------------------------------------|--------------------------------|----------------------|
| Site Name: <u>NEY Service Station</u> | Project Number: <u>2960035</u> | Date: <u>9/15/98</u> |
| Well ID: <u>MW-NASB-025</u>           | Field Personnel: <u>SAP KS</u> |                      |

| Parameter               | 6     | 7     | 8     | 9     | 10    | 11    |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Time (min.)             | 1336  | 1339  | 1342  | 1345  | 1348  | 1351  |
| Depth to Water (ft)     | 8.57  | 8.73  | 8.73  | 8.73  | 8.93  | 8.93  |
| Purge Rate (L/min)      | .2    | .2    | .2    | .2    | .2    | .2    |
| Volume Purged (L)       | 4.6   | 5.2   | 5.8   | 6.4   | 7.0   | 7.6   |
| pH                      | 6.40  | 6.36  | 6.36  | 6.37  | 6.33  | 6.37  |
| Temperature (°C)        | 19.12 | 19.18 | 19.22 | 19.45 | 19.47 | 19.55 |
| Conductivity (µmhos/cm) | 432   | 437   | 437   | 437   | 437   | 435   |
| Dissolved Oxygen (mg/L) | 3.37  | 3.29  | 3.32  | 3.35  | 3.40  | 3.38  |
| Turbidity (NTU)         | 23    | 24    | 24    | 21    | 20    | 20    |
| eH (mV)                 | 69    | 69    | 69    | 71    | 71    | 72    |
| Parameter               | 12    | 13    | 14    | 15    | 16    | 17    |
| Time (min.)             | 1354  | 1357  |       |       |       |       |
| Depth to Water (ft)     | 9.25  | 9.25  |       |       |       |       |
| Purge Rate (L/min)      | .2    | .2    |       |       |       |       |
| Volume Purged (L)       | 8.2   | 8.8   |       |       |       |       |
| pH                      | 6.37  | 6.36  |       |       |       |       |
| Temperature (°C)        | 19.74 | 20.14 |       |       |       |       |
| Conductivity (µmhos/cm) | 428   | 423   |       |       |       |       |
| Dissolved Oxygen (mg/L) | 3.47  | 3.47  |       |       |       |       |
| Turbidity (NTU)         | 20    | 20    |       |       |       |       |
| eH (mV)                 | 71    | 71    |       |       |       |       |

|   |
|---|
| Comments and Observations: _____<br>_____<br>_____<br>_____ |
|---|



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

|                 |                           |                   |                     |
|-----------------|---------------------------|-------------------|---------------------|
| Site Name:      | <u>NE Service Station</u> | Project Number:   | <u>291-00-55</u>    |
| Well ID:        | <u>MW-NASB-026</u>        | Well Lock Status: | <u>locked</u>       |
| Well Condition: | <u>Good</u>               | Weather:          | <u>drizzle = 75</u> |

|                     |                        |                      |               |
|---------------------|------------------------|----------------------|---------------|
| Gauge Date:         | <u>9/15/98</u>         | Gauge Time:          | <u>9 1440</u> |
| Sounding Method:    | <u>Slope Indicator</u> | Measurement Ref:     | <u>TOC</u>    |
| Stick Up/Down (ft): | <u>Do</u>              | Well Diameter (in.): |               |

|                         |                 |                        |               |
|-------------------------|-----------------|------------------------|---------------|
| Purge Date:             | <u>9/15/98</u>  | Purge Time:            | <u>1441</u>   |
| Purge Method:           | <u>Low Flow</u> | Field Personnel:       | <u>SAP/KS</u> |
| Ambient Air VOCs (ppm): |                 | Well Mouth VOCs (ppm): |               |

### WELL VOLUME

|                            |              |                           |  |
|----------------------------|--------------|---------------------------|--|
| A. Well Depth (ft):        | <u>12.55</u> | D. Well Volume/ft (L):    |  |
| B. Depth to Water (ft):    | <u>7.65</u>  | C. Well Volume (L)        |  |
| E. Liquid Depth (ft) (A-B) |              | E. Three Well Volumes (L) |  |

| Parameter               | Beginning | 1     | 2     | 3     | 4     | 5     |
|-------------------------|-----------|-------|-------|-------|-------|-------|
| Time (min.)             | 1444      | 1447  | 1450  | 1453  | 1456  | 1459  |
| Depth to Water (ft)     | 7.85      | 7.75  | 7.75  | 7.75  | 7.75  | 7.75  |
| Purge Rate (l/min)      | 0.2       | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   |
| Volume Purged (L)       | 0.6       | 1.2   | 1.8   | 2.4   | 3.0   | 3.6   |
| pH                      | 6.15      | 7.04  | 7.12  | 7.13  | 7.14  | 7.16  |
| Temperature (°C)        | 19.14     | 20.39 | 21.25 | 21.37 | 21.43 | 21.52 |
| Conductivity (µmhos/cm) | 406       | 451   | 463   | 462   | 461   | 468   |
| Dissolved Oxygen (mg/L) | 11.33     | 5.82  | 4.75  | 4.58  | 4.45  | 4.41  |
| Turbidity (NTU)         | 4         | 2     | 2     | 2     | 2     | 2     |
| eH (mV)                 | -199      | -220  | -226  | -225  | -225  | -225  |

|                                      |   |                              |             |
|--------------------------------------|---|------------------------------|-------------|
| Total Quantity of Water Removed (L): | <u>3.6</u>  |                              |             |
| Samplers:                            | <u>SAP/KS</u>   | Sampling Time (Start/End):   | <u>1500</u> |
| Sampling Date:                       | <u>9/15/98</u>  | Decontamination Fluids Used: | <u>DZ</u>   |
| Sample Type:                         | <u>Grab</u>   | Sample Preservatives:        | <u>HCL</u>  |
| Sample Bottle IDs:                   | <u>MW-NASB-04/XD1</u>   |                              |             |
| Sample Parameters:                   | <u>VOC DRO/GRO</u>  |                              |             |
| Comments and Observations:           | <u>Has petroleum odor, containerized purge water and disposed of at treatment plant</u> |                              |             |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

|                 |                     |                   |                     |
|-----------------|---------------------|-------------------|---------------------|
| Site Name:      | NEX Service Station | Project Number:   | 29600.35            |
| Well ID:        | MW-NASB-225         | Well Lock Status: | Locked              |
| Well Condition: | Good                | Weather:          | Overcast ± 75 humid |

|                     |                 |                      |      |
|---------------------|-----------------|----------------------|------|
| Gauge Date:         | 9/15/98         | Gauge Time:          | 1525 |
| Sounding Method:    | Slope Indicator | Measurement Ref:     | TOC  |
| Stick Up/Down (ft): | Flush mount     | Well Diameter (in.): | 2"   |

|                         |          |                        |        |
|-------------------------|----------|------------------------|--------|
| Purge Date:             | 9/15/98  | Purge Time:            | 1525   |
| Purge Method:           | Low Flow | Field Personnel:       | SAPLES |
| Ambient Air VOCs (ppm): | Ø        | Well Mouth VOCs (ppm): | Ø      |

| WELL VOLUME                |       |                           |  |
|----------------------------|-------|---------------------------|--|
| A. Well Depth (ft):        | 14.31 | D. Well Volume/ft (L):    |  |
| B. Depth to Water (ft):    | 6.82  | C. Well Volume (L)        |  |
| E. Liquid Depth (ft) (A-B) |       | E. Three Well Volumes (L) |  |

| Parameter               | Beginning | 1     | 2     | 3     | 4     | 5     |
|-------------------------|-----------|-------|-------|-------|-------|-------|
| Time (min.)             | 1528      | 1531  | 1535  | 1537  | 1540  | 1543  |
| Depth to Water (ft)     | 6.84      | 6.84  | 6.84  | 6.84  | 6.84  | 6.84  |
| Purge Rate (l/min)      | .2        | .2    | .2    | .2    | .2    | .2    |
| Volume Purged (L)       | .6        | 6.83  | 1.8   | 2.4   | 3.0   | 3.6   |
| pH                      | 7.39      | 6.83  | 6.79  | 6.77  | 6.76  | 6.77  |
| Temperature (°C)        | 20.87     | 18.28 | 18.82 | 20.10 | 21.11 | 21.40 |
| Conductivity (µmhos/cm) | 159       | 294   | 289   | 101   | 272   | 263   |
| Dissolved Oxygen (mg/L) | 7.34      | 2.36  | 2.66  | 2.77  | 2.71  | 2.71  |
| Turbidity (NTU)         | 225       | 186   | 178   | 113   | 80    | 61    |
| eH (mV)                 | -138      | -119  | -116  | -112  | -112  | -113  |

|                                      |  |                              |      |
|--------------------------------------|--|------------------------------|------|
| Total Quantity of Water Removed (L): | 10.8   |                              |      |
| Samplers:                            | SAP  | Sampling Time (Start/End):   | 1635 |
| Sampling Date:                       | 9/15/98  | Decontamination Fluids Used: | DJ   |
| Sample Type:                         | Grab   | Sample Preservatives:        | HCL  |
| Sample Bottle IDs:                   | MW-NASB-05   |                              |      |
| Sample Parameters:                   | VOC   DRO   GRO  |                              |      |
| Comments and Observations:           | Containerized purge water and disposed of at treatment plant |                              |      |



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING (OVERFLOW PAGE)

|                                       |                                |                      |
|---------------------------------------|--------------------------------|----------------------|
| Site Name: <u>NZY Service Station</u> | Project Number: <u>2960035</u> | Date: <u>9/15/98</u> |
| Well ID: <u>MW-NASB-225</u>           | Field Personnel: <u>KS/SP</u>  |                      |

| Parameter               | 6     | 7     | 8     | 9     | 10    | 11    |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Time (min.)             | 1546  | 1549  | 1552  | 1555  | 1558  | 1601  |
| Depth to Water (ft)     | 6.84  | 6.84  | 6.84  | 6.84  | 6.84  | 6.84  |
| Purge Rate (L/min)      | .2    | .2    | .2    | .2    | .2    | .2    |
| Volume Purged (L)       | 4.2   | 4.8   | 5.4   | 6.0   | 6.6   | 7.2   |
| pH                      | 6.76  | 6.76  | 6.76  | 6.76  | 6.76  | 6.76  |
| Temperature (°C)        | 21.45 | 21.37 | 21.32 | 21.22 | 21.14 | 21.07 |
| Conductivity (µmhos/cm) | 245   | 244   | 239   | 239   | 240   | 244   |
| Dissolved Oxygen (mg/L) | 2.73  | 2.78  | 2.85  | 2.98  | 3.03  | 3.09  |
| Turbidity (NTU)         | 55    | 51    | 49    | 54    | 60    | 31    |
| eH (mV)                 | -113  | -114  | -115  | -115  | -116  | -116  |
| Parameter               | 12    | 13    | 14    | 15    | 16    | 17    |
| Time (min.)             | 1604  | 1607  | 1610  | 1613  | 1616  | 1619  |
| Depth to Water (ft)     | 6.84  | 6.84  | 6.84  | 6.84  | 6.84  | 6.84  |
| Purge Rate (L/min)      | .2    | .2    | .2    | .2    | .2    | .2    |
| Volume Purged (L)       | 7.8   | 8.4   | 9.0   | 9.6   | 10.2  | 10.8  |
| pH                      | 6.76  | 6.76  | 6.76  | 6.76  | 6.75  | 6.75  |
| Temperature (°C)        | 21.01 | 20.97 | 20.72 | 19.32 | 19.03 | 18.89 |
| Conductivity (µmhos/cm) | 239   | 239   | 233   | 232   | 240   | 233   |
| Dissolved Oxygen (mg/L) | 3.15  | 3.18  | 3.16  | 2.92  | 3.08  | 3.14  |
| Turbidity (NTU)         | 24    | 24    | 26    | 20    | 15    | 12    |
| eH (mV)                 | -115  | -115  | -115  | -180  | -121  | -121  |

Comments and Observations: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING (OVERFLOW PAGE)

|                                       |                                 |                      |
|---------------------------------------|---------------------------------|----------------------|
| Site Name: <u>NEK Service Station</u> | Project Number: <u>29600.35</u> | Date: <u>9/15/98</u> |
| Well ID: <u>MW-NASB-225</u>           | Field Personnel: <u>SAE, KS</u> |                      |

| Parameter               | 6     | 7     | 8     | 9     | 10 | 11 |
|-------------------------|-------|-------|-------|-------|----|----|
| Time (min.)             | 1622  | 1625  | 1628  | 1631  |    |    |
| Depth to Water (ft)     | 6.84  | 6.84  | 6.84  | 6.84  |    |    |
| Purge Rate (L/min)      | .2    | .2    | .2    | .2    |    |    |
| Volume Purged (L)       | 11.4  | 12.0  | 12.6  | 13.4  |    |    |
| pH                      | 6.73  | 6.73  | 6.73  | 6.73  |    |    |
| Temperature (°C)        | 18.84 | 18.74 | 18.72 | 18.75 |    |    |
| Conductivity (µmhos/cm) | 241   | 235   | 232   | 232   |    |    |
| Dissolved Oxygen (mg/L) | 3.21  | 3.26  | 3.27  | 3.28  |    |    |
| Turbidity (NTU)         | 12    | 9     | 9     | 9     |    |    |
| eH (mV)                 | -121  | -119  | -119  | -118  |    |    |
| Parameter               | 12    | 13    | 14    | 15    | 16 | 17 |
| Time (min.)             |       |       |       |       |    |    |
| Depth to Water (ft)     |       |       |       |       |    |    |
| Purge Rate (L/min)      |       |       |       |       |    |    |
| Volume Purged (L)       |       |       |       |       |    |    |
| pH                      |       |       |       |       |    |    |
| Temperature (°C)        |       |       |       |       |    |    |
| Conductivity (µmhos/cm) |       |       |       |       |    |    |
| Dissolved Oxygen (mg/L) |       |       |       |       |    |    |
| Turbidity (NTU)         |       |       |       |       |    |    |
| eH (mV)                 |       |       |       |       |    |    |

|   |
|---|
| Comments and Observations: _____<br>_____<br>_____<br>_____ |
|---|

**Attachment C**

**Field Record of Water Quality  
Parameter Analysis Forms**

**FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS**

|   |   |                      |
|---|---|----------------------|
| Project Name: <u>NEX</u>  | Project No: <u>29600.35</u>               | Date: <u>7/13/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: <u>Sunny, 80°</u> |   |                      |
| EA Personnel: <u>SC, BA</u>   | Equipment: <u>VSI-600XL inlayed water</u> |                      |

| Location | Time (0000 hr) | Depth To Water (ft) | Depth to Product | pH   | Temperature (°C) | Dissolved Oxygen (mg/L) | Conductivity (µmhos) | Redox (mV) |
|----------|----------------|---------------------|------------------|------|------------------|-------------------------|----------------------|------------|
| MW 23    |                | 7.18                | -                | 7.29 | 17.00            | 7.33                    | 192                  | 21         |
| 24       |                | 5.82                | -                | 6.72 | 12.52            | 7.86                    | 75                   | 39         |
| 25       |                | 6.72                | -                | 6.91 | 13.26            | 7.30                    | 134                  | 50         |
| 26       |                | 6.95                | -                | 6.61 | 14.70            | 4.71                    | 519                  | 80         |
| 225      |                | 6.50                | -                | 6.45 | 14.66            | 4.33                    | 258                  | 75         |
| 8        |                | 2.99                | -                | 6.52 | 14.76            | 4.25                    | 263                  | 74         |
| 9        |                | 4.05                | -                | 6.68 | 14.05            | 3.00                    | 166                  | 74         |
| 10       |                | 6.67                | -                | 6.62 | 13.78            | 3.07                    | 192                  | 42         |
|          |                |                     |                  |      |                  |                         |                      |            |
| HAAS-1   |                | 6.98                | -                | 7.22 | 16.83            | 7.07                    | 97                   | 36         |
| 2        |                | 6.47                | -                | 6.86 | 15.83            | 2.45                    | 344                  | 60         |
| 8        |                | 6.60                | -                | 6.57 | 13.43            | 5.88                    | 167                  | 53         |
| 9        |                | DRY                 | -                | -    | -                | -                       | -                    | -          |
| 10       |                | 6.00                | -                | 7.09 | 14.18            | 4.95                    | 91                   | 35         |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



## FIELD RECORD OF EQUIPMENT CALIBRATION

|                              |                      |                   |
|------------------------------|----------------------|-------------------|
| EA Personnel: <i>PDA, SC</i> | Date: <i>7/13/98</i> | Time: <i>0800</i> |
|------------------------------|----------------------|-------------------|

| Equipment:   |                 |                 | ID No.:               |
|--------------|-----------------|-----------------|-----------------------|
| Parameter    | Buffer          | Initial Reading | Check/Calibrate       |
| pH           |                 |                 |                       |
| pH           | <i>7.00</i>     | <i>5.96</i>     | <i>7.00 ✓</i>         |
| pH           |                 |                 |                       |
| Temperature  |                 | <i>20.89</i>    |                       |
| Conductivity | <i>10,000</i>   | <i>10,608</i>   | <i>Cal to 10002 ✓</i> |
| D.O.         | <i>100% sat</i> |                 | <i>6199.1% ✓</i>      |
| Redox        | <i>Zobell</i>   | <i>336</i>      | <i>306</i>            |

| Equipment: |                            |                 | ID No.:         |
|------------|----------------------------|-----------------|-----------------|
| Parameter  | Calibration Gas (ppm)      | Initial Reading | Check/Calibrate |
| PID        | <i>100 ppm Isobutylene</i> | <i>106</i>      |                 |
| FID        |                            |                 |                 |

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS**

|   |   |                      |
|---|---|----------------------|
| Project Name: <u>NEX</u>  | Project No: <u>29600.35</u>                 | Date: <u>7/22/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: <u>overcast 850</u> |   |                      |
| EA Personnel: <u>B A, SC</u>  | Equipment: <u>YSI-600XL interface meter</u> |                      |

| Location | Time (0000 hr) | Depth To Water (ft) | Depth to Product | pH   | Temperature (°C) | Dissolved Oxygen (mg/L) | Conductivity (µmhos) | Redox (mV) |
|----------|----------------|---------------------|------------------|------|------------------|-------------------------|----------------------|------------|
| MW 23    |                | 7.43                | —                | 7.64 | 11.58            | 7.12                    | 193                  | 189        |
| 24       |                | 5.99                | —                | 7.23 | 11.20            | 2.29                    | 118                  | 186        |
| 25       |                | 6.81                | —                | 7.20 | 11.65            | 4.28                    | 291                  | 182        |
| 26       |                | 7.18                | —                | 7.08 | 13.31            | 4.94                    | 516                  | 218        |
| 225      |                | 6.65                | —                | 7.15 | 15.09            | 3.64                    | 260                  | 163        |
| 8        |                | 3.30                | —                | 7.14 | 15.49            | 2.46                    | 256                  | 183        |
| 9        |                | 4.21                | —                | 7.22 | 15.91            | 4.62                    | 176                  | 177        |
| 10       |                | 6.77                | —                | 7.29 | 14.15            | 3.87                    | 187                  | 50         |
|          |                |                     |                  |      |                  |                         |                      |            |
| A1451    |                | 7.20                | —                | 7.55 | 16.18            | 7.41                    | 101                  | 188        |
| 2        |                | 6.71                | —                | 7.57 | 13.86            | 3.79                    | 826                  | 203        |
| 8        |                | 6.76                | —                | 7.27 | 14.23            | 5.71                    | 196                  | 186        |
| 9        |                | DRY                 | —                | —    | —                | —                       | —                    | —          |
| 10       |                | 6.21                | —                | 7.35 | 14.92            | 1.98                    | 125                  | 190        |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### FIELD RECORD OF EQUIPMENT CALIBRATION

|                                     |                      |                   |
|-------------------------------------|----------------------|-------------------|
| EA Personnel: <u>Brian Andersen</u> | Date: <u>7/21/98</u> | Time: <u>0800</u> |
|-------------------------------------|----------------------|-------------------|

| Equipment: <u>YSI-610D</u> |             |                 | ID No.:         |
|----------------------------|-------------|-----------------|-----------------|
| Parameter                  | Buffer      | Initial Reading | Check/Calibrate |
| pH                         | —           |                 |                 |
| pH                         | 7.00        | 7.94            | 7.01            |
| pH                         |             |                 |                 |
| Temperature                |             |                 | 23.13 (C/P)     |
| Conductivity               | 10.000      | 10.205          | 10.048          |
| D.O.                       | % Sat water | 92              | 99.9            |
| Redox                      | Zobell      | 255             | 184             |

| Equipment: <u>TVA-1000</u> |                       |                 | ID No.:         |
|----------------------------|-----------------------|-----------------|-----------------|
| Parameter                  | Calibration Gas (ppm) | Initial Reading | Check/Calibrate |
| PID                        | iSobutylene<br>106    |                 | 106 ✓           |
| FID                        |                       |                 |                 |

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS**

|  |  |                     |
|--|--|---------------------|
| Project Name: <u>NEX Service Station</u>                                     | Project No: <u>2960035</u>                   | Date: <u>8/6/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: <u>Sunny, Warm, Breezy</u> |  |                     |
| EA Personnel: <u>BDA SD</u>  | Equipment: <u>YSI 610 DM Interface Probe</u> |                     |

| Location | Time (0000 hr)  | Depth To Water (ft) | Depth to Product | pH              | Temperature (°C) | Dissolved Oxygen (mg/L) | Conductivity (µmhos) | Redox (mV)       |
|----------|-----------------|---------------------|------------------|-----------------|------------------|-------------------------|----------------------|------------------|
| MW-23    | 0846            | 7.67                | —                | 8.24            | 19.97            | 6.13                    | 181                  | 1685             |
| MW-24    | 0905            | 6.38                | —                | 8.05            | 15.48            | 5.93                    | 97                   | 167.7            |
| MW-25    | 0925            | 6.91                | —                | 7.73            | 22.13            | 5.26                    | 223                  | 160              |
| MW-26    | 0858            | 7.42                | —                | 7.93            | 19.14            | 6.74                    | 454                  | 191              |
| MW-25    | 0952            | 6.75                | —                | 7.37            | 16.81            | 5.34                    | 251                  | 180.5            |
| MW-8     | <del>0908</del> | <del>7.01</del>     | —                | <del>7.45</del> | <del>16.75</del> | <del>5.99</del>         | <del>213</del>       | <del>171.8</del> |
| MW-9     | <del>0948</del> | <del>4.38</del>     | —                | <del>7.42</del> | <del>16.78</del> | <del>2.03</del>         | <del>238</del>       | <del>180.4</del> |
| MW-10    | 0955            | 6.85                | —                | 7.51            | 15.98            | 4.80                    | 193.00               | 27.4             |
| AAS-1    | 0848            | 7.42                | —                | 8.15            | 20.03            | 7.20                    | 110                  | 166              |
| 2        | 0852            | 6.89                | —                | 7.94            | 20.31            | 7.00                    | 382                  | 183              |
| 8        | 0909            | 7.01                | —                | 7.95            | 15.75            | 5.99                    | 213                  | 171.8            |
| 9        | TDRI            | —                   | —                | —               | —                | —                       | —                    | —                |
| 10       | 0906            | 6.62                | —                | 8.09            | 16.15            | 5.51                    | 121                  | 167              |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## FIELD RECORD OF EQUIPMENT CALIBRATION

|                       |              |            |
|-----------------------|--------------|------------|
| EA Personnel: SD, BDA | Date: 8/6/98 | Time: 0800 |
|-----------------------|--------------|------------|

| Equipment: YSI 610D |                       | ID No.: 51      |                 |
|---------------------|-----------------------|-----------------|-----------------|
| Parameter           | Buffer                | Initial Reading | Check/Calibrate |
| pH                  | -                     |                 |                 |
| pH                  | 7.00                  | 7.19            | 7.01 ✓          |
| pH                  | -                     |                 |                 |
| Temperature         |                       |                 |                 |
| Conductivity        | Cond Sol              | 10,084          | ✓               |
| D.O.                | Saturatn<br>Calibratn | 113%            | 99.7% ✓         |
| Redox               |                       | 260 @ 23°       | 187.6 - 23°C    |

| Equipment: PID - TVA 1000 |                          | ID No.: 55      |                 |
|---------------------------|--------------------------|-----------------|-----------------|
| Parameter                 | Calibration Gas<br>(ppm) | Initial Reading | Check/Calibrate |
| PID                       | 102.00                   |                 | Calibrate 102 ✓ |
| FID                       |                          |                 |                 |

|   |
|---|
| Comments: _____<br>_____<br>_____<br>_____<br>_____ |
|---|

**FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS**

|   |   |                      |
|---|---|----------------------|
| Project Name: <u>NEK Service Station</u>          | Project No: <u>2960035</u>                  | Date: <u>8/25/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: |   |                      |
| EA Personnel: <u>SJC</u>                          | Equipment: <u>YSI 600XL Interface meter</u> |                      |

| Location | Time (0000 hr) | Depth To Water (ft) | Depth to Product | pH   | Temperature (°C) | Dissolved Oxygen (mg/L) | Conductivity (µmhos) | Redox (mV) |
|----------|----------------|---------------------|------------------|------|------------------|-------------------------|----------------------|------------|
| MW 23    |                | 7.57                | —                | 7.27 | 15.32            | 3.11                    | 153                  | 275        |
| 24       |                | 6.54                | —                | 6.62 | 13.33            | 2.82                    | 108                  | 262        |
| 25       |                | 6.29                | —                | 6.58 | 13.95            | 1.69                    | 290                  | 239        |
| 26       |                | 7.29                | —                | 6.55 | 14.90            | 0.61                    | 481                  | 302        |
| 225      |                | 6.56                | —                | 6.43 | 17.03            | 1.93                    | 291                  | 254        |
| 8        |                | 3.17                | —                | 6.48 | 13.80            | 2.08                    | 307                  | 248        |
| 9        |                | 4.24                | —                | 6.64 | 16.05            | 2.49                    | 242                  | 245        |
| 10       |                | 6.75                | —                | 6.74 | 15.47            | 2.12                    | 212                  | 239        |
|          |                |                     |                  |      |                  |                         |                      |            |
| AMS-1    |                | 7.30                |                  | 6.91 | 19.17            | 5.13                    | 107                  | 292        |
| 2        |                | 6.73                |                  | 6.72 | 18.05            | 2.15                    | 469                  | 306        |
| 8        |                | 6.94                |                  | 6.46 | 15.66            | 1.43                    | 226                  | 246        |
| 9        |                | dry                 | —                | —    | —                | —                       | —                    | —          |
| 10       |                | 6.86                |                  | 6.80 | 16.32            | 1.55                    | 135                  | 268        |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### FIELD RECORD OF EQUIPMENT CALIBRATION

|                          |                      |                  |
|--------------------------|----------------------|------------------|
| EA Personnel: <b>SYC</b> | Date: <b>8/25/98</b> | Time: <b>830</b> |
|--------------------------|----------------------|------------------|

| Equipment: <b>YSI-660 XL</b> |                        |                              | ID No.:         |
|------------------------------|------------------------|------------------------------|-----------------|
| Parameter                    | Buffer                 | Initial Reading              | Check/Calibrate |
| pH                           | <b>7</b>               | <b>7.21 / 6.99</b>           | calibrate ✓     |
| pH                           | <b>10</b>              | <del>9.92</del> <b>10.00</b> | check           |
| pH                           |                        |                              |                 |
| Temperature                  |                        |                              |                 |
| Conductivity                 | <b>10000 M</b>         | <b>10,013</b>                | check           |
| D.O.                         | <b>sat cal</b>         | <b>100.0%</b>                | calibrate       |
| Redox                        | <b>20 Dell @ 22.31</b> | <b>233</b>                   | calibrate       |

| Equipment: |                       |                 | ID No.:         |
|------------|-----------------------|-----------------|-----------------|
| Parameter  | Calibration Gas (ppm) | Initial Reading | Check/Calibrate |
| PID        |                       |                 |                 |
| FID        |                       |                 |                 |

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS**

|   |             |                      |
|---|-------------|----------------------|
| Project Name: <u>N24 Service Station</u>                            | Project No: | Date: <u>9/18/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: <u>Sunny, 750</u> |             |                      |
| EA Personnel: <u>SYC</u>  | Equipment:  |                      |

| Location | Time (0000 hr) | Depth To Water (ft) | Depth to Product | pH   | Temperature (°C) | Dissolved Oxygen (mg/L) | Conductivity (µmhos) | Redox (mV) |
|----------|----------------|---------------------|------------------|------|------------------|-------------------------|----------------------|------------|
| MW-23    |                | 7.65                |                  | 7.31 | 18.31            | 7.68                    | 176                  | 253        |
| 24       |                | 6.63                |                  | 6.40 | 12.37            | 1.66                    | 183                  | 132        |
| 25       |                | 6.84                |                  | 6.34 | 15.92            | 1.66                    | 204                  | 111        |
| 26       |                | 7.39                |                  | 6.38 | 17.52            | 4.06                    | 4.29                 | 213        |
| 225      |                | 6.74                |                  | 6.20 | 15.97            | 3.73                    | 297                  | 166        |
| 8        |                | 3.38                |                  | 6.20 | 14.61            | 4.01                    | 335                  | 140        |
| 9        |                | 4.26                |                  | 6.38 | 17.20            | 5.67                    | 252                  | 146        |
| 10       |                | 6.75                |                  | 6.42 | 17.91            | 6.04                    | 181                  | 160        |
|          |                |                     |                  |      |                  |                         |                      |            |
| AMS-1    |                | 7.39                |                  | 7.27 | 18.57            | 8.13                    | 109                  | 256        |
| 2        |                | 6.88                |                  | 6.68 | 16.02            | 5.11                    | 631                  | 267        |
| 8        |                | 7.11                |                  | 6.44 | 15.57            | 1.39                    | 232                  | 107        |
| 9        |                | dry                 |                  |      |                  |                         |                      |            |
| 10       |                | 6.95                |                  | 6.65 | 16.20            | 2.28                    | 139                  | 151        |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |
|          |                |                     |                  |      |                  |                         |                      |            |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## FIELD RECORD OF EQUIPMENT CALIBRATION

|               |              |       |
|---------------|--------------|-------|
| EA Personnel: | Date: 9/8/98 | Time: |
|---------------|--------------|-------|

| Equipment:   |                |                 | ID No.:         |
|--------------|----------------|-----------------|-----------------|
| Parameter    | Buffer         | Initial Reading | Check/Calibrate |
| pH           | 7.00           | 7.32 / 6.99     | Calibrate       |
| pH           | 10.00          | 9.71 / 10.00    | Calibrate       |
| pH           | 4.00           | 4.35 / 3.99     | Calibrate       |
| Temperature  |                |                 |                 |
| Conductivity | 10,000 $\mu$ S | 10123 110000    | Calibrate       |
| D.O.         | 100%           | 99%             | ✓               |
| Redox        | Zobell         | 236             | ✓               |

| Equipment: TVA-1000 |                       |                 | ID No.:         |
|---------------------|-----------------------|-----------------|-----------------|
| Parameter           | Calibration Gas (ppm) | Initial Reading | Check/Calibrate |
| PID                 | 102                   | 99              | ✓               |
| FID                 |                       |                 |                 |

|   |
|---|
| Comments: _____<br>_____<br>_____<br>_____<br>_____ |
|---|

### FIELD RECORD OF WATER QUALITY PARAMETER ANALYSIS

|   |                            |                      |
|---|----------------------------|----------------------|
| Project Name: <u>NEV Service Station</u>          | Project No: <u>2960035</u> | Date: <u>9/23/98</u> |
| Weather/Temperature/Barometric Pressure/Humidity: |                            |                      |
| EA Personnel: <u>SYC</u>                          | Equipment:                 |                      |

| Location | Time<br>(0000 hr) | Depth To<br>Water (ft) | Depth to<br>Product | pH                 | Temperature<br>(°C) | Dissolved<br>Oxygen<br>(mg/L) | Conductivity<br>(µmhos) | Redox<br>(mV) |  |
|----------|-------------------|------------------------|---------------------|--------------------|---------------------|-------------------------------|-------------------------|---------------|--|
| MW 23    |                   | 7.88                   | —                   | 7.81               | 18.32               | 5.88                          | 204                     | 220           |  |
| 24       |                   | 6.77                   | —                   | 7.11               | 15.11               | 5.36                          | 107                     | 118           |  |
| 25       |                   | 6.99                   | —                   | 6.68               | 14.37               | 2.58                          | 430                     | 84            |  |
| 26       |                   | 7.61                   | —                   | 6.73               | 15.92               | 1.82                          | 458                     | 109           |  |
| 225      |                   | 6.84                   | —                   | 6.45               | 15.79               | 2.61                          | 258                     | 43            |  |
| 8        |                   | 3.54                   | —                   | 6.71               | 12.82               | 3.15                          | 293                     | 112           |  |
| 9        |                   | 4.30                   | —                   | 6.52               | 13.73               | 2.33                          | 281                     | 95            |  |
| 10       |                   | 6.83                   | —                   | 6.65               | 13.20               | 3.96                          | 223                     | 56            |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
| AMS-1    |                   | 7.99                   | —                   | 7.57               | 18.47               | 5.28                          | 101                     | 222           |  |
| 2        |                   | 7.06                   | —                   | 7.01               | 18.12               | 3.02                          | 536                     | 245           |  |
| 8        |                   | 7.21                   | —                   | 6.93               | 15.69               | 1.74                          | 216                     | 84            |  |
| 9        |                   | dry                    | —                   | —                  | —                   | —                             | —                       | —             |  |
| 10       |                   | 7.01                   | —                   | insufficient water |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |
|          |                   |                        |                     |                    |                     |                               |                         |               |  |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### FIELD RECORD OF EQUIPMENT CALIBRATION

|                          |                      |       |
|--------------------------|----------------------|-------|
| EA Personnel: <u>SYC</u> | Date: <u>9/22/98</u> | Time: |
|--------------------------|----------------------|-------|

| Equipment:   |           |                 | ID No.:         |
|--------------|-----------|-----------------|-----------------|
| Parameter    | Buffer    | Initial Reading | Check/Calibrate |
| pH           | 10        | 9.85 / 10.00    | cal             |
| pH           | 7         | 7.30 / 6.96     | cal             |
| pH           |           |                 |                 |
| Temperature  |           |                 |                 |
| Conductivity | 10,000µ   | 9997            | X               |
| D.O.         | 100%      | 138% / 100      | calibrate       |
| Redox        | at 20.9°C | 2.36            | cal             |

| Equipment: |                       |                 | ID No.:         |
|------------|-----------------------|-----------------|-----------------|
| Parameter  | Calibration Gas (ppm) | Initial Reading | Check/Calibrate |
| PID        | 102                   | 112 / 101       | calibrate       |
| FID        |                       |                 |                 |

|   |
|---|
| Comments: _____<br>_____<br>_____<br>_____<br>_____ |
|---|

**Attachment D**

**Laboratory Analytical Report  
for Ground-Water Samples**

### SAMPLE DESIGNATIONS

| Sample Location | Sample Designation |
|-----------------|--------------------|
| MW-NASB-023     | MW-NASB-01         |
| MW-NASB-024     | MW-NASB-02         |
| MW-NASB-025     | MW-NASB-03         |
| MW-NASB-026     | MW-NASB-04         |
| MW-NASB-225     | MW-NASB-05         |
| MW-NASB-026 DUP | MW-NASB-XD1        |
| RINSE BLANK     | MW-NASB-RB         |
| TRIP BLANK      | Trip               |



21 October 1998

Mr. John Carnwright  
Waste Management Services-New York.  
3 Washington Center  
Newburgh, NY 12550

Re: NEX (24600.35)

Dear Mr. Cranwright:

Enclosed is our report on the analysis of eight water samples collected for the NEX project on 15 September 1998. The invoice is included.

Please contact me if you have any questions or require further information and refer to report 981526. Unless other arrangements are made, we reserve the right to dispose of your samples sixty (60) days from the date of this letter. We will retain the raw data for seven years from this date.

Sincerely,

A handwritten signature in cursive script that reads "Michael J. Walsh".

Michael J. Walsh  
Laboratory Project Manager

enclosure

---

LABORATORY DATA REPORT

Prepared for:

Waste Management Services-New York  
NEX

Prepared by:

EA Laboratories  
19 Loveton Circle  
Sparks, Maryland 21152

Report 981526

October 1998

**TABLE OF CONTENTS**  
**NEX**  
**EA Laboratories Report No. 981526**

---

1. NARRATIVE
2. CHAIN OF CUSTODY
3. ORGANIC DATA
  - A. VOLATILES
  - B. TPH-DRO
  - C. TPH-GRO

1. NARRATIVE

**EA Laboratories  
ANALYTICAL NARRATIVE**

Client: **Waste Management Services**  
Site: **NEX**  
Project number: **24600.35**

EA Laboratories Report: **981526**  
Laboratory Project Manager: **Michael J. Walsh**  
Report Date: **21 October 1998**

---

This report contains the results of the analysis of eight water samples collected on 15 September 1998 in support of the referenced project.

***SAMPLE RECEIPT***

The samples arrived by Fed Ex at EA Laboratories on 17 September 1998. Upon receipt, the samples were inspected and compared with the chain-of-custody record. The samples were then logged into the laboratory computer system with assigned laboratory accession numbers and released for analysis.

| <u>Client Sample Designation</u> | <u>EA Lab Number</u> |
|----------------------------------|----------------------|
| MW-NASB-01                       | 9811389              |
| MW-NASB-02                       | 9811390              |
| MW-NASB-03                       | 9811391              |
| MW-NASB-04                       | 9811392              |
| MW-NASB-05                       | 9811393              |
| MW-NASB-XDI                      | 9811394              |
| MW-NASB-RB                       | 9811395              |
| TRIP                             | 9811396              |

Following this narrative section are a glossary of data qualifiers used in this report (Table 1) and the original chain-of-custody. Analytical results and quality control information are summarized in the appended data package which has been formatted to be consistent with the deliverable requirements of this project.

***QUALITY CONTROL***

The following sections are ordered as the data appears in this report. They contain observations made during sample analysis, summarize the results of quality control measurements, and address the impact on data usability based upon project Data Quality Objectives. For each fractional analysis the narrative includes:

Sample chronology: This section summarizes the sample history by fraction including the sample preparation method and date, analytical method, and analysis date. Anything unusual about the samples, digestates, or extracts is identified. Holding time compliance is evaluated in this section.

**EA Laboratories**  
**ANALYTICAL NARRATIVE**

Client: **Waste Management Services**  
Site: **NEX**  
Project number: **24600.35**

EA Laboratories Report: **981526**  
Laboratory Project Manager: **Michael J. Walsh**  
Report Date: **21 October 1998**

---

Laboratory method performance: All quality control criteria for method performance must be met for all target analytes for data to be reported. These criteria generally apply to instrument tune, calibration, method blanks, and Laboratory Control Samples (LCS). In some instances where method criteria fail, useable data can be obtained and are reported with client approval. The narrative will then include a thorough discussion of the impact on data quality.

Sample performance: Quality control field samples are analyzed to determine any measurement bias due to the sample matrix based on evaluation of matrix spikes (MS), matrix spike duplicates (MSD), and laboratory duplicates (D). If acceptance criteria are not met, matrix interferences are confirmed either by reanalysis or by inspection of the LCS results to verify that laboratory method performance is in control. Data are reported with appropriate qualifiers or discussion.

**AROMATIC VOLATILES by GC/MS - WATER (EA9811389 - EA9811396)**

Sample Chronology: Eight aqueous samples and associated quality control were analyzed on 28-29 September and 02, 02-03, and 04-05 October 1998 for benzene, toluene, ethylbenzene, and xylenes (BTEX) plus methyl-tert-butyl ether (MTBE) by USEPA SW-846 Methods 5030/8260. All holding times were met for the initial analyses.

- The requested analytical method, USEPA Method 602, could not be performed due to instrument failure. Samples were analyzed by Method 8260 in order to meet analytical holding times.
- Samples MW-NASB-04, MW-NASB-05, and MW-NASB-XD1 were initially analyzed at dilutions of 5X, 10X, and 10X, respectively. The samples were reanalyzed on 02-03 and 04-05 October 1998 at dilutions of 50X, 400X, and 100X, respectively, in order to bring the concentrations of target analytes within calibration range.
- Sample MW-NASB-RB was reanalyzed on 02 October 1998 to confirm carry-over in the initial analysis. No analytes were detected in the reanalysis.
- The 02 and 04-05 October 1998 daily matrix spike/matrix spike duplicate (MS/MSD) pairs were performed on other clients' samples.

Laboratory Method Performance: All laboratory method performance criteria were met for the reported samples.

**EA Laboratories  
ANALYTICAL NARRATIVE**

Client: **Waste Management Services**  
Site: **NEX**  
Project number: **24600.35**

EA Laboratories Report: **981526**  
Laboratory Project Manager: **Michael J. Walsh**  
Report Date: **21 October 1998**

---

**Sample Performance:** All quality control criteria were met for the reported samples with the following exception:

- Internal standard areas were below -50% of the daily standard areas in the initial analysis of sample MW-NASB-04; reanalysis at a 50X dilution had all internal standard areas within range (as did the MS/MSD performed on the 50X dilution), confirming a matrix effect in the undiluted (5X) sample.
- The MS/MSD performed with the 04-05 October 1998 sequence had the recoveries of toluene (60%, 70%) below the lower QC limit of 77%; these low recoveries may be due to a high native concentration of toluene in the sample.

**PURGEABLE TPH by GC/FID - WATER (EA9811389- EA9811395)**

**Sample Chronology:** Seven aqueous samples and associated quality control were analyzed by Maine Method 4.2.17 on 29 September 1998 for total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) . All holding times were met.

- Samples MW-NASB-04, MW-NASB-05, and MW-NASB-XD1 were re-analyzed at 5X dilutions in order to bring the concentration of GRO within calibration range.

**Laboratory Method Performance:** All laboratory method performance criteria were met for the reported samples with the following exception:

- There was no duplicate laboratory control sample analyzed which is required by the method.

**Sample Performance:** All quality control criteria were met for the reported samples with the following exceptions:

- The MS/MSD (58%/58%) had recoveries for GRO below the lower QC limit of 60%.

**EXTRACTABLE TPH by GC - WATER (EA9811389- EA9811395)**

**Sample Chronology:** Seven aqueous samples and associated quality control were extracted on 22 September 1998 and analyzed on 02-03 and 04-05 October 1998 according to Maine Method 4.1.25 for diesel range organics (DRO). All holding times were met.

- Samples MW-NASB-04, MW-NASB-05, and MW-NASB-XDI were re-analyzed at 10X dilutions in order to bring the concentration of DRO within calibration range.

**EA Laboratories**  
**ANALYTICAL NARRATIVE**

Client: **Waste Management Services**  
Site: **NEX**  
Project number: **24600.35**

EA Laboratories Report: **981526**  
Laboratory Project Manager: **Michael J. Walsh**  
Report Date: **21 October 1998**

---

Laboratory Method Performance: All laboratory method performance criteria were met for the reported samples with the following exceptions:

- The pH of the samples were not taken at the time of extraction. The pHs of different aliquots were taken at a later time and met criteria. There should be no impact on the data.
- A resolution check and commercial diesel standard were not run daily as required by the method. The resolution check and commercial diesel standard were analyzed with the initial calibration. There is no corrective action mentioned in the method. There should be no impact on the data.

Sample Performance: All quality control criteria were met for the reported samples.

***CERTIFICATION OF RESULTS***

The Laboratory certifies that this report meets the project requirements for analytical data as stated in the Analytical Task Order (ATO) and the chain-of-custody. In addition, the Laboratory certifies that the data as reported meet the Data Quality Objectives for precision, accuracy, and completeness specified for this project or as stated in EA Laboratories Quality Assurance program for other than the conditions detailed above. It is recommended by the Laboratory that this analytical report should only be reproduced in its entirety. EA Laboratories is not responsible for any assumptions of data quality if partial packages are used to interpret data. Release of the data contained in this report has been authorized by the appropriate Laboratory Manager as verified by the following signature.

  
\_\_\_\_\_  
Michael J. Walsh, Laboratory Project Manager

October 21, 1998

2. CHAIN OF CUSTODY







**EA LABORATORIES COOLER RECEIPT**  
Discrepancy Facsimile and Chains-of-Custody

Report: 981526

PLEASE DELIVER TO: \_\_\_\_\_  
 Company/Department: \_\_\_\_\_  
 Fax Number: \_\_\_\_\_  
 SENT BY: \_\_\_\_\_  
 Number of Pages(including cover page): 1 of

Project: NEX  
 Received: 17-SEP-98 10:00  
 COC: COC0003805  
 Samples: 9811389-9811396

**A. PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 9/17/98  
 by(print) S Sewell (sign) [Signature]

|     |  |                                      |                          |                                    |
|-----|--|--------------------------------------|--------------------------|------------------------------------|
| 1.  | Did cooler come with a shipping slip, airbill, ect?<br>If Yes, circle courier: <u>Federal Express UPS</u> Handcarried Other _____        | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
|     | Enter Airbill Number here: <u>8067124373</u>   |                                      |                          |                                    |
| 2.  | Were custody seals present on outside of cooler?<br>How many and where: <u>4 front, back</u> seal date: <u>9/16/98</u> seal name _____   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 3.  | Were custody seals unbroken and intact at the time of arrival?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 4.  | Were the samples screened for radioactivity using the Geiger counter upon receipt?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input checked="" type="radio"/> N |
| 5.  | Were the Chains-of-Custody sealed in a plastic bag and taped inside of the lid?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 6.  | Were the Chains-of-Custody filled out properly(ink, signed, etc.)?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 7.  | Were the Chains-of-Custody relinquished by sampler?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 8.  | Did you sign the Chains-of-Custody papers in the appropriate places?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 9.  | Was project identifiable from Chains-of-Custody?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 10. | If required, was enough ice used? Type of ice: <input checked="" type="radio"/> Wet <input type="radio"/> Blue <input type="radio"/> Dry | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 11. | Was cooler temperature below 6C?<br>Enter Cooler Temperature: <u>3°C</u>   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N            |
| 12. | Have designated person initial here to acknowledge receipt of cooler: <u>[Signature]</u> (date) <u>9/17/98</u>                           |                                      |                          |                                    |

**B. LOG-IN PHASE:** Date samples were logged in: \_\_\_\_\_  
 by(print) S Sewell (sign) [Signature]

|     |   |                                      |                          |                          |
|-----|---|--------------------------------------|--------------------------|--------------------------|
| 13. | Describe type of packing in cooler: <u>ice + vermiculite</u>  |                                      |                          |                          |
| 14. | Were all bottles sealed in separate plastic bags?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 15. | Did all bottles arrive unbroken and were labels in good condition?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 16. | Were all bottles labels complete(I.D., date, time, signature, preservative, etc.)?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 17. | Were correct containers used for the analysis indicated on the Chains-of-Custody?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 18. | Were correct preservatives added to the samples?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 19. | Was a sufficient amount of sample sent for the analysis indicated on the Chain-of-Custody?  | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 20. | Were bubbles absent in Volatiles samples?   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
| 22. | Were any samples subcontracted to an outside laboratory?<br>If YES, enter LSOA# _____ Subcontracting Laboratory Name: _____   | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |
|     | EA Accession Numbers of subcontracted samples: _____  |                                      |                          |                          |
| 23. | Were any Non-Conformance records initiated by SMO for this project?<br>If YES, enter Non-Conformance Number: <u>3-5275</u> LPM notified:<br>Reason for Non-Conformance: <u>3-5275 Broken bottle</u> | <input checked="" type="radio"/> YES | <input type="radio"/> NO | <input type="radio"/> N/ |

**\*If any "NO" answers are bold a Non-Conformance Record is required from SMO.**

**USE OTHER SIDE OF THIS FORM TO NOTE DETAILS CONCERNING CHECK-IN PROBLEMS**

Special Notes:

Please respond within 24 hours of receipt of this facsimile if any changes are required to the Chain-of-Custody. Failure to notify EA Laboratories 1 hours of receipt of this facsimile of any required changes could result in additional premiums and may not guarantee samples analyzed within hok time if changes to the analysis are required.

**Confidentiality Notice**

This facsimile transmission, including this Cover Sheet and any accompanying documents (individually and collectively), contains information from Laboratories. This transmission is intended solely for the use of the individual or entity to which it is addressed and may contain information that is privileged, or confidential. If the reader of this message is not the intended recipient or an employee or agent responsible for delivering this trans to the intended recipient, you are hereby notified that any reproduction, dissemination, distribution, or other use of this transmission or its substanc strictly prohibited. If you have received this transmission in error, you are directed to contact us and arrange for the return of this transmission at c expense.

**THE EA LABORATORIES Difference - Our Total Commitment to QUALITY**

For Project Specific Inquires, Contact your Laboratory Project Manager at (410) 771-4920

Effective: 28 October 1997

### 3. ORGANIC DATA

A. VOLATILES

























B. TPH-DRO

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NAS 01

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811389  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X981R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/02/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) | UG/L | Q |
|---------|--------------------|-----------------|------|---|
|         | DRO AS C10-28 EVEN |                 | 50   | U |

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASS-01

Lab Name: EA LABS Contract NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811390  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X984R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/02/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

|  |                    |    |   |
|--|--------------------|----|---|
|  | DRO AS C10-28 EVEN | 50 | U |
|--|--------------------|----|---|

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MV7-NASB-03

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811391  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X985R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/02/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) | UG/L | Q |
|---------|--------------------|-----------------|------|---|
|         | DRO AS C10-28 EVEN |                 | 64   |   |

1B  
SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASB-04

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811392  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X988R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/03/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) | UG/L | Q |
|---------|--------------------|-----------------|------|---|
|         | DRO AS C10-28 EVEN |                 | 6800 | E |

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MV-NASE 04DL

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811392DL  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3Y002R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/04/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 10.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

|  |                    |      |   |
|--|--------------------|------|---|
|  | DRO AS C10-28 EVEN | 7800 | D |
|--|--------------------|------|---|

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASB-05

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811393  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X989R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/03/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) UG/L | Q |
|---------|--------------------|----------------------|---|
|         | DRO AS C10-28 EVEN | 5600                 | E |

1B  
SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASB-05DL

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811393DL  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3Y003R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/04/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 10.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) | UG/L | Q |
|---------|--------------------|-----------------|------|---|
|         | DRO AS C10-28 EVEN |                 | 6600 | D |

1B  
SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASB-XD1

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811394  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X990R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/03/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

| CAS NO. | COMPOUND           | (ug/L or ug/Kg) | UG/L | Q |
|---------|--------------------|-----------------|------|---|
|         | DRO AS C10-28 EVEN |                 | 7200 | E |

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

100-NAS5-XDIDL

Lab Name: EA LABS Contract: NEX  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811394DL  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3Y004R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/05/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 10.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

|  |                    |      |   |
|--|--------------------|------|---|
|  | DRO AS C10-28 EVEN | 8400 | D |
|--|--------------------|------|---|

1B  
SEMI-VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-NASB-RE

Lab Name: EA LABS Contract: NEA  
 Lab Code: EAENG Case No.: 981526 SAS No.: \_\_\_\_\_ SDG No.: 9811389  
 Matrix: (soil/water) WATER Lab Sample ID: 9811395  
 Sample wt/vol: 1000 (g/ml) ML Lab File ID: SW3X991R.D  
 Level: (low/med) LOW Date Received: 09/17/98  
 % Moisture: \_\_\_\_\_ decanted:(Y/N) N Date Extracted: 09/22/98  
 Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/03/98  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_\_\_

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

|  |                    |    |   |
|--|--------------------|----|---|
|  | DRO AS C10-28 EVEN | 50 | U |
|--|--------------------|----|---|

C. TPH-GRO















**Attachment E**

**Maine Department of  
Environmental Protection  
and Northern Division  
Correspondence on NEX  
Quarterly Reporting Format**



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.  
GOVERNOR

EDWARD O. SULLIVAN  
COMMISSIONER

October 22, 1998

Mr. Emil Klawitter  
Code 1823 EK  
Department of the Navy, Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, PA 19113-2090

Re: Modifications to Quarterly Monitoring Reports  
Navy Exchange Service Station-BNAS

Dear Mr. Klawitter:

The Department has looked at the Navy's suggested modifications to the Quarterly Monitoring Reports outlined in a letter dated September 25, 1998, and has the following comments.

|  |   |   |
|--|---|---|
| SVE/Aquifer Air Sparging Operations Summary (letter)                   | No Change   | Agreed  |
| SVE System Performance (letter)  | Do not report flow rates or removal rates in letter. Only ...                           | Agreed  |
| Aquifer Air Sparging System Performance (letter)                       | Do not report flow rates or temperatures in letter. Only ...                            | Agreed  |
| Well Gauging & Water Quality Indicator Parameter Measurements (letter) | Only report problems or important measurements  | Agreed  |
| Quarterly Ground Water Sampling (letter)                               | Only report problems or important observations. A summary of results is not required... | Agreed  |
| Figure 1-Site Plan   | Retain, however possibly increase font size of sparge wells & SVE trenches.             | The Department strongly agrees with increasing the font size of sparge wells & SVE trenches |
| Figure 2 Daily & Cumulative Total Volatile Hydrocarbon Removal         | Change right axis to 1 to 100 in lieu of 0 to 500                                       | Agreed  |
| Figure 3 Daily Total Volatile Hydrocarbon Removal                      | Delete-Data can be found in Fig. 2  | Agreed  |
| Figure 4 Interpreted Water Table Elevations                            | Retain  | Agreed  |
| Table 1 Summary of SVE Performance Data                                | Retain  | Agreed  |

AUGUSTA  
STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0017  
(207) 287-7688  
RAY BLDG., HOSPITAL ST.

BANGOR  
106 HOGAN ROAD  
BANGOR, MAINE 04401  
(207) 941-4570 FAX: (207) 941-4584

PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769-2094  
(207) 764-0477 FAX: (207) 764-1507

Page 2 of 2

|   |  |   |
|---|--|---|
| Table 2 Summary of Aquifer Air Sparging Systems Operations Data         | Delete-data can be found in attachments  | Agreed  |
| Table 3 Summary of Well Gauging Data                                    | Delete-data can be found in attachments  | Please retain   |
| Table 4 Summary of Water Quality Indicator Parameters                   | Delete-data can be found in attachments  | Please retain   |
| Table 5 Summary of Analytical Results for Groundwater samples collected | Delete -data can be found in table 6     | Agreed  |
| Table 6 Summary of Analytical Results for Ground Water Samples          | Retain-Include Clean up goal in footnote | Agreed  |
| MEDEP Comments from Previous Report                                     | New                                      | Please include the Navy's responses to these comments |
| Attachments (field forms)   | No Change                                | Agreed  |

Thank for this opportunity to comment on your proposed modifications to the quarterly monitoring reports. If you have any questions or comments regarding this matter, please feel free to call me at (207) 287-7713.

Respectfully,



Claudia Sait  
 Project Manager-Federal Facilities  
 Bureau of Remediation & Waste Management

Cf: File  
 Dick Behr-DEP  
 Greg Apraham-BNAS



**DEPARTMENT OF THE NAVY**

NORTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
18 INDUSTRIAL HIGHWAY  
MAIL STOP, 662  
LESTER, PA 19112-9089

IN REPLY REFER TO

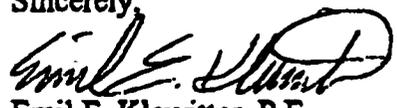
5090  
Code 1821/EK  
25 SEP 1998

Maine Department of Environmental Protection  
Attn: Ms. Claudia Sait  
Office of the Commissioner  
17 State House Station  
Augusta, ME 04333

Dear Ms. Sait:

Subj: NAVY EXCHANGE SERVICE STATION (BUILDING 538) QUARTERLY  
PROGRESS REPORTS, NAS BRUNSWICK, ME

We believe our meeting on September 15, 1998 was informative and provided a good exchange of information on the remediation of the NEX Service Station. During that meeting, we discussed reducing some of the information contained in the quarterly progress reports. We feel all the information contained in the reports is not required to be reported on a quarterly basis, and our goal is to streamline these reports. Attachment 1 contains our recommendations as to how the reports will be configured starting with the September 1998 report. Please let us know if these changes do not meet your regulatory requirements. Should you have any questions or wish to discuss this with me further, please contact me at (610) 595-0567x161.

Sincerely,  
  
Emil E. Klawitter, P.E.  
Remedial Project Manager  
By direction of the  
Commanding Officer

Copy to:  
Greg Apraham, NAS Brunswick

**Attachment 1 – Recommended Changes to the NEX Quarterly Report**

|   |  |
|---|--|
| <b>Soil Vapor Extraction/Aquifer Air Sparging Operations Summary (letter)</b>   | <b>No change</b>   |
| <b>Soil Vapor Extraction System Performance (letter)</b>                        | <b>Do not report flow rates or removal rates in letter. Only textually report highlights and/or problems with performance</b>      |
| <b>Aquifer Air Sparging System Performance (letter)</b>                         | <b>Do not report flow rates or temperatures in letter. Only textually report highlights and/or problems with performance</b>       |
| <b>Well Gauging and Water Quality Indicator Parameter Measurements (letter)</b> | <b>Only report problems or important measurements.</b>   |
| <b>Quarterly ground water Sampling (letter)</b>                                 | <b>Only report any problems or important observations. A summary of results is not required as this is contained in the table.</b> |
| <b>Figure 1 – Site Plan</b>   | <b>Retain, however possibly increase font size of sparge wells &amp; SVE trenches.</b>   |
| <b>Figure 2 Daily and Cumulative Total Volatile Hydrocarbon Removal</b>         | <b>Change right axis to 0 to 100 in lieu of 0 to 500</b>   |
| <b>Figure 3 Daily Total Volatile Hydrocarbon removal</b>                        | <b>Delete – Data can be found in Figure 2</b>  |
| <b>Figure 4 Interpreted Water Table Elevations</b>                              | <b>Retain</b>  |
| <b>Table 1 Summary of Soil Vapor Extraction System Performance Data</b>         | <b>Retain</b>  |
| <b>Table 2 Summary of Aquifer Air Sparging System Operations Data</b>           | <b>Delete – Data can be found in attachments</b>   |
| <b>Table 3 Summary of Well Gauging Data</b>                                     | <b>Delete – Data can be found in attachments</b>   |
| <b>Table 4 Summary of Water Quality Indicator Parameters</b>                    | <b>Delete – Data can be found in attachments</b>   |
| <b>Table 5 Summary of Analytical Results for Groundwater samples collected</b>  | <b>Delete – Data can be found in Table 6</b>   |
| <b>Table 6 Summary of Analytical Results for Ground water Samples</b>           | <b>Retain – Include Clean-up goal in footnote</b>  |
| <b>MEDEP Comments from previous report</b>                                      | <b>New</b>   |
| <b>Attachments (field forms)</b>  | <b>No change</b>   |

**Attachment F**

**Maine Department of  
Environmental Protection Comments  
on Previous Report**

**RESPONSE TO STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS  
ON QUARTERLY PROGRESS REPORT ON SOIL VAPOR EXTRACTION/  
AQUIFER AIR SPARGING REMEDIAL SYSTEM OPERATIONS  
1 JANUARY – 31 MARCH 1998, NAVY EXCHANGE SERVICE STATION  
(BUILDING 538), NAVAL AIR STATION, BRUNSWICK**

**GENERAL COMMENTS**

1. On 27 February 1998, the Department provided the Navy with comments on the quarterly report for the period 1 October through 31 December 1997. The most recent quarterly report does not contain a section with responses to these comments. The Department requests that the Navy include a response to comments letter as an attachment to each quarterly report.

**Response**—Comment noted. A response to MEDEP comments letter will be incorporated in future NEX quarterly progress reports.

**SPECIFIC COMMENTS**

2. **Soil Vapor Extraction Performance**—EA measured the soil vapor data presented in Table 1 with a Foxboro TVA-1000 photoionization/flame ionization detector. Based on notes in Table 1, the Department believes the parts per million (ppm) data represent concentration data obtained with the PID? Is this correct? Also, what is the response factor?

**Response**—The Department is correct that the photoionization detection option was used to assess VOC concentrations in extracted soil vapor. The instrument calibration records are provided in the appended field data sheets. Instrument calibration is performed per manufacturer's instructions using a certified calibration gas standard (100 ppm isobutylene) at a response factor of one.

3. There are a number of features depicted on Figures 1 and 4 that are difficult to read. Future reports must include legible site plans. For example, anyone reviewing the quarterly reports must be able to identify the individual soil vapor extraction and air sparging systems.

**Response**—Comment noted. Figures 1 and 4 will be reviewed for legibility and modified as required with respect to font selection and size, spacing of features, line width, etc. as suggested by the Department.

4. **Well Gauging and Water Quality Indicator Parameter Measurements**—Every couple of weeks the contractor measures a number of water quality parameters in the monitoring wells and sparge wells. Because some of the parameters are sensitive to sampling methods, the Department questions the worth of the time and effort to collect these data between the quarterly low flow ground-water sampling episodes.

For example, on 16 March 1998, the contractor used low flow sampling techniques to sample MW-NASB-026 for the usual suite of indicator parameters, including oxygen. On 26 March, the contractor sampled the same well. (It is assumed this sample was collected with a bailer.) The 16 March low flow sample contained 1.38 mg/L oxygen while the sample collected on 26 March contained 7.1 mg/L oxygen. Because MW-NASB-026 contained more than 15 mg/L GRO and DRO, it is suspected the lower of the two oxygen concentrations is closer to the *in situ* concentration. Similarly, redox values recorded during low flow sampling were negative while the “grab” sample produced a positive reduction-oxidation potential.

To learn more about how the contractor collects the samples, Dick Behr, the staff geologist for this site, would like to participate in one of the future monitoring events. Could you give me the name and phone number of the person I should contact to arrange for this oversight work?

**Response**—The contractor conducts bi-monthly operations and maintenance visits to assess and optimize remedial system performance. Relative to system optimization, extracted soil vapor is analyzed for VOC concentration and the system’s mechanical performance is modulated based on vacuum (SVE) and pressure (AAS) gauge readings. Water quality indicator parameters are measured *in situ* (i.e., the monitoring sonde is directly immersed in ground water in the well) using a YSI Model 600XL multiparameter instrument to provide operations personnel with real-time data, particularly temperature and dissolved oxygen, as a basis for performing system adjustments. For example, elevated dissolved oxygen is desired in areas targeted for active AAS. As requested, the Navy arranged for MEDEP oversight of the ground-water monitoring event conducted on 15 September 1998.

5. **Quarterly Ground-Water Sampling**—Due to construction activities, the report indicates MW-NASB-027 was abandoned and removed from the monitoring program. The Navy notes several recent sampling rounds did not reveal BTEX, MTBE, or GRO above detection limits. MW-NASB-027 has, however, routinely contained DRO above the State’s MEG. As suggested in an earlier review memo, the Department would like to set up a meeting to discuss this ground-water monitoring program with NAS Brunswick.

**Response**—As requested, a meeting was convened on 15 September 1998 among Navy, MEDEP, and the contractor’s representatives to discuss the NEX ground-water monitoring program.

6. The contractor collected the ground-water samples using low flow sampling techniques. As indicated above, it is obvious the low flow sampling techniques produce more representative samples. However, there may be ways to improve the sampling plan.

During low flow sampling, drawdown did not stabilize in two of the five wells sampled. Failure to achieve stabilization indicates the pumping rate was too high for the formation. The contractor pumped each well at 0.2 gal/min (approximately 760 mL/min). It is not uncommon to reduce flow rates to approximately 150 mL/min to stabilize drawdown. A peristaltic pump is an acceptable alternative if the contractor is unable to further reduce flow rates with the Grundfos Redi-Flo 2. The Department frequently uses peristaltic pumps to achieve flow rates in the 100-500 mL/min range.

**Response**—Comment noted. As discussed in the 15 September 1998 meeting, equipment selection for low flow ground-water sampling at the NEX has been made to maintain consistency of method with the Long-Term Monitoring Program. While it is recognized that turbidity stabilization may be problematic in low-yielding shallow wells at the NEX, we believe that the ground-water sampling results are representative of the subsurface conditions as evidenced by temperature, conductivity, redox, and dissolved oxygen indicator-parameter stabilization. A review of the field records of well gauging, purging, and sampling from the 15 September 1998 sampling event suggests that the low flow techniques using submersible pumping equipment were effective in achieving the water quality indicator parameter stabilization targets, with minimal well drawdown and pumping rates of 0.1-0.2 L/min. Stabilization of the turbidity parameter at <10 NTU was achieved in four of the five wells sampled. Monitoring well MW-NASB-025 exhibited stabilized turbidity at 20 NTU following a 31-minute purging interval at 0.2 L/min.

7. **Ground-Water Sampling Results Summary**—Ground water in the vicinity of the remedial effort continues to contain significant fuel related compounds. MW-NASB-026 and MW-NASB-225 remain the most contaminated wells with total GRO/DRO concentrations in excess of 15,000  $\mu\text{g/L}$ . To properly monitor ground water in the vicinity of the NEX service station, it is critical to include several downgradient monitoring wells. Based on ground-water flow directions depicted on Figure 2, monitoring wells MW-NASB-008, MW-NASB-009, and MW-NASB-010 are reasonable candidates for the next round of ground-water monitoring.

**Response**—The Navy currently conducts quarterly ground-water monitoring at five monitoring wells in the vicinity of the NEX. In addition, downgradient monitoring wells MW-NASB-008, MW-NASB-009, and MW-NASB-010 are sampled on an annual basis. The Navy is proceeding with the installation of a new downgradient monitoring well to the south of MW-NASB-225 across Burbank Avenue.

**RESPONSE TO STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS  
ON QUARTERLY PROGRESS REPORT ON SOIL VAPOR EXTRACTION/  
AQUIFER AIR SPARGING REMEDIAL SYSTEM OPERATIONS  
1 APRIL - 30 JUNE 1998, NAVY EXCHANGE SERVICE STATION  
NAVAL AIR STATION, BRUNSWICK**

1. **Page 4, Quarterly Ground-Water Sampling**—Using the Grundfos submersible pump, the Navy's consultant was unable to obtain stable turbidity readings. The field records indicate EA increased the pumping rate to maintain flow. This is precisely the type of problem one runs into with shallow wells using submersible pumps. The Department recommends trying a peristaltic pump to see if lower turbidity values can be achieved.

**Response**—Equipment selection for the low-flow ground-water sampling at NEX has been made to maintain consistency of method with the Long-Term Monitoring Program. While it is recognized that turbidity stabilization may be problematic in low-yielding shallow wells at NEX, we believe that the ground-water sampling results are representative of the subsurface conditions as evidenced by temperature, conductivity, redox, and dissolved oxygen indicator-parameter stabilization.

A review of the field records of well gauging, purging, and sampling from the 15 September 1998 sampling event suggest that the low-flow techniques using submersible pumping equipment were effective in achieving the water quality indicator parameter stabilization targets, with minimal well drawdown and pumping rates of 0.1-0.2 L/min. Stabilization of the turbidity parameter at <10 NTU was achieved in 4 of the 5 wells sampled. Monitoring well MW-NASB-025 exhibited stabilized turbidity at 20 NTU following a 31-minute purging interval at 0.2 L/min.

2. **Page 5, Ground-Water Sampling Results Summary**—The last paragraph of this section is accurate but misleading. It lists six wells that did not exceed the Maximum Exposure Guideline for BTEX, MTBE, and TPH-GRO. However, the most recent round of samples found five of the six wells exceeded the TPH-DRO Maximum Exposure Guideline of 50 µg/L. This exceedance needs to be noted in the summary.

**Response**—Comment noted. In future quarterly progress reports, regulatory exceedances will be denoted in bold in the tabular summary. Discussions of ground-water sampling results will be deleted from the body of the quarterly progress report.

3. **Attachment D, Laboratory Analytical Report for Ground-Water Samples**—The Department requests copies of the chromatograms for the June 1998 DRO and GRO samples. Future quarterly reports must also include the chromatograms for both the GRO and DRO samples.

**Response**—Chromatograms are not provided as a deliverable from a laboratory unless specifically ordered. While we feel they are not needed for our system operation and reporting in the Quarterly Report, we agree they will be useful in interpreting the TPH-DRO values. We would like to discuss with MEDEP the benefits of the chromatograms and how they can be used to meet MEDEP cleanup requirements.