FINAL

LONG-TERM GROUNDWATER MONITORING OCTOBER 1999 SAMPLING

OPERABLE UNIT B
POLELINE ROAD DISPOSAL AREA
FORT RICHARDSON, ALASKA

Contract No. DACA-85-94-D-005
Delivery Order No. 21

Prepared for

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT
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List of Acronyms

Army	United States Army, Public Works
bgs	below ground surface
DL	analytical detection limit
mg	milligram
l	Liter
OUB	Operable Unit B
ppm	parts per million
SPSH	six-phase soil heating
SVE	soil vapor extraction
TCE	trichloroethene
URSGWC	URS Greiner Woodward Clyde
VOCs	Volatile Organic Compounds

URS Greiner Woodward Clyde (URSGWC), formerly Woodward-Clyde, was contracted by the United States Army Corps of Engineers on behalf of the United States Army, Public Works (Army) to conduct long-term groundwater monitoring at Operable Unit B (OUB), Poleline Road Disposal Area, Fort Richardson, Alaska. OUB is a former Army disposal area for chemical warfare training materials and has been the subject of several environmental investigations, a feasibility study, and a treatability study.

The objective of the long-term groundwater monitoring is twofold: to collect data on groundwater contaminant trends and to devise an appropriate long-term monitoring plan for the site. According to the *Long-Term Groundwater Monitoring Workplan, Operable Unit B, Poleline Road Disposal Area, Fort Richardson, Alaska* (WC 1997), eight rounds of sampling will be performed initially to evaluate groundwater contaminants over time. Five rounds of sampling have been completed. The sampling dates were: November 1997, June 1998, October 1998, March 1999, and October 1999. This report summarizes the fifth round of sampling conducted in October 1999.

The tasks to be completed under the *Long-Term Groundwater Monitoring Workplan, Operable Unit B, Poleline Road Disposal Area, Fort Richardson, Alaska* (WC 1997) include the following:

- Conduct eight rounds of groundwater sampling for volatile organic compounds (VOCs) in 20 monitoring wells at OUB and sample for natural attenuation parameters during the first two rounds.
- Set up and maintain a database of VOC groundwater data from OUB using Microsoft Access®. Structure the database to accommodate additional data from future long-term monitoring. Enter existing VOC data and update the database after each sampling event.
- Prepare a technical memorandum after each round of sampling that includes the results of the sampling event, a description of changes in contaminant concentrations since the previous sampling event, and recommendations for the next round of sampling.
- Evaluate natural attenuation data after the first two rounds of sampling and revise the sampling plan based on the evaluation.
- Evaluate data after the eight rounds of sampling are complete and provide recommendations for future long-term monitoring needs.

3.1 LOCATION

The Fort Richardson Army Post occupies 61,500 acres of land (Figure 3-1). OUB is located on the Fort Richardson Army Post approximately 10 miles northeast of Anchorage, Alaska, 1 mile south of the Eagle River, and 0.6 miles north of the Anchorage Regional Landfill (Figure 3-2). Access to the area is by Poleline Road, a gravel road that runs northeast southwest along a power line route and the Eklutna Water Line. OUB is bisected by Barrs Boulevard, a gravel road extending from the Glenn Highway to Poleline Road.

3.2 SITE DESCRIPTION

OUB is a low-lying, relatively flat area, which is bordered by a wooded, 80-foot hill to the west, wetlands located directly south and southwest of the main disposal area (Area 3 and Area 4), and low wooded hills on the remaining perimeters (Figure 3-3). The area where buried waste has been detected by geophysical survey is approximately 1.5 acres in size. The main disposal area was cleared of vegetation during a 1994 warfare material removal action. No significant re-vegetation has occurred.

3.3 GEOLOGY

Regional surficial deposits are fluvially reworked glacial sediments and glacial tills. These deposits appear to be up to 30 feet thick at the site and consist of unstratified to poorly stratified clays, silts, sands, gravels, and boulders. A basal till lies below the surficial deposits and overlies an advance moraine/till complex. Underlying the glacial sediments is bedrock composed of a hard black fissile claystone.

The subsurface soils are dense glacial tills and generally silty sands with some gravel. Thin, discontinuous clay lenses were observed rarely. Observations during drilling confirm a typical fluvio-glacial setting; a heterogeneous system of discontinuous, relatively permeable channels with intervening denser, less permeable sediments.

3.4 HYDROGEOLOGY

Four water-bearing intervals have been identified at OUB: a perched interval, a shallow interval, an intermediate interval, and a deep aquifer. The detection of contaminants in all four intervals suggests that they are interconnected to some degree. Observations made while drilling indicate that the saturated intervals are separated by zones of very dense, low porosity, compact tills. The compact tills are dry or slightly moist.

The perched interval was observed in borings drilled between Area A-2 and the wetlands, and in Area A-3 (Figure 3-3). The top of the perched interval was encountered at 4 to 10 feet below ground surface (bgs), and the bottom was found at 6 to 12 feet bgs. The average thickness of the perched interval is approximately 5 feet. The perched interval is recharged mainly by surface water from the wetlands, although some recharge also occurs from precipitation. The only monitoring well installed in the perched interval is MW-14 (AP-3746).

The shallow saturated interval is an average of 10 feet thick; the top was encountered at 20 to 25 feet bgs, and the bottom was found at 28 to 36 feet bgs. Groundwater elevations indicate that

shallow groundwater is flowing in a north-northeast direction. Because of the localized nature of water-bearing zones at this site, it is difficult to tell whether the water-bearing units are hydraulically connected between wells. The shallow interval is recharged by water from the discontinuous perched interval and by infiltration of precipitation.

The intermediate interval was observed while drilling monitoring well MW-16 (AP-3748). The saturated portion of the intermediate interval was encountered at approximately 65 to 95 feet bgs in MW-16 (AP-3748). The intermediate saturated interval does not correlate with the other deep wells on site, suggesting that it is an isolated lens with limited continuity. There may be several isolated lenses of saturated material within the intermediate interval.

Five monitoring wells at OUB penetrate the deep aquifer, the top of which was encountered from approximately 80 to 125 feet bgs. The deep aquifer is an advance moraine/till complex with a thickness of between 3 and 40 feet. Groundwater elevations indicate that the flow direction in the deep aquifer is locally to the northeast and regionally to the northwest. Available data indicate that the deep aquifer below the site is not connected with deep aquifers used for drinking water wells in the community of Eagle River (over one mile to the northeast).

The deep aquifer overlies a claystone bedrock unit with unknown thickness. Four of the five deep wells at OUB penetrate the bedrock unit and the well screens extend slightly into the bedrock. The top of bedrock was encountered from 120 to 170 feet beneath the site.

The ultimate discharge area of the water-bearing intervals at OUB is probably the Eagle River, approximately 1 mile north of the site (Figure 3-2). The Eagle River flows into the Knik Arm of Cook Inlet approximately 5 miles northwest of OUB. The river is not used as a drinking water source.

3.5 LAND USE

The land surrounding OUB currently is used for Army training activities and recreational purposes. The Eklutna Water Line, a pipeline which supplies Anchorage and part of the Eagle River community with drinking water from Eklutna Lake (over 15 miles from the site), runs immediately west of the site.

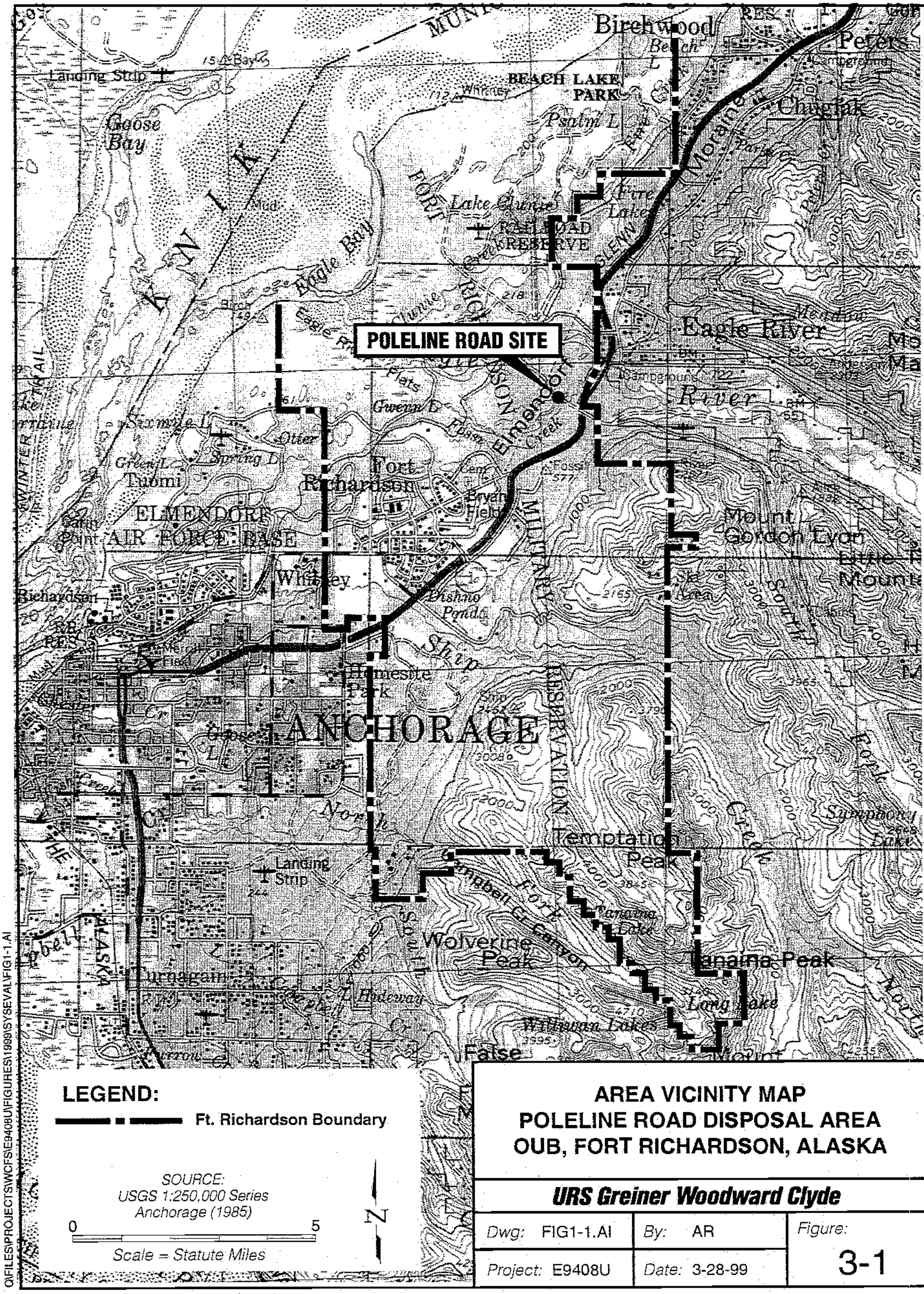
There are no plans for development of the OUB site at the present time. Yield from the perched, shallow, and intermediate saturated intervals may be too low to supply an average household, and installation of septic systems would preclude use of the shallow or perched intervals for drinking water. The deep aquifer may provide sufficient yield for drinking water wells however, future development of the deep aquifer for this purpose is unlikely due to the close proximity of the Eklutna Water Line.

3.6 CURRENT SITE CONDITIONS

A design verification study was conducted in 1997 to evaluate the applicability of six-phase soil heating (SPSH) as an in-situ technology for remediating solvent contaminated soils. The initial field portion of the study was completed in December 1997.

A pilot study was conducted in 1998 to evaluate the applicability of high vacuum extraction as an in-situ technology for remediating solvent contaminated groundwater and soils. The field portion of the study was completed in October 1998.

The design verification study in conjunction with soil vapor extraction (SVE) continued in 1999. Three arrays were installed in area A-3. The SVE and SPSH began running in July and reached completion in October 1999.



AREA VICINITY MAP
POLELINE ROAD DISPOSAL AREA
OUB, FORT RICHARDSON, ALASKA

URS Greiner Woodward Clyde

Dwg: FIG1-1.AI	By: AR	Figure:
Project: E9408U	Date: 3-28-99	3-1

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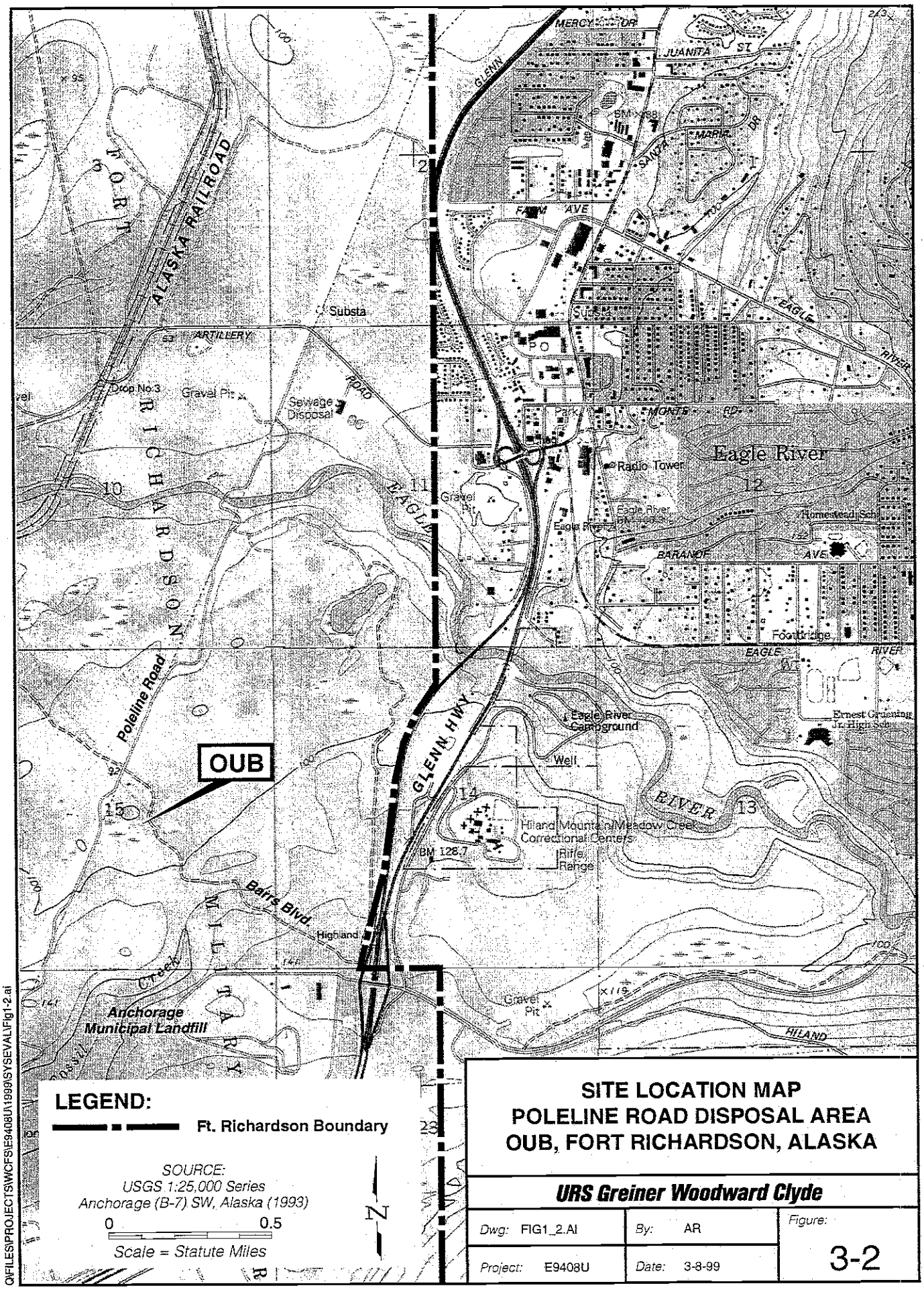

LEGEND:

Ft. Richardson Boundary

SOURCE:
USGS 1:25,000 Series
Anchorage (B-7) SW, Alaska (1993)

0 0.5

Scale = Statute Miles

N

SITE LOCATION MAP
POLELINE ROAD DISPOSAL AREA
OUB, FORT RICHARDSON, ALASKA

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Project: E9408U	*Date:* 3-8-99	

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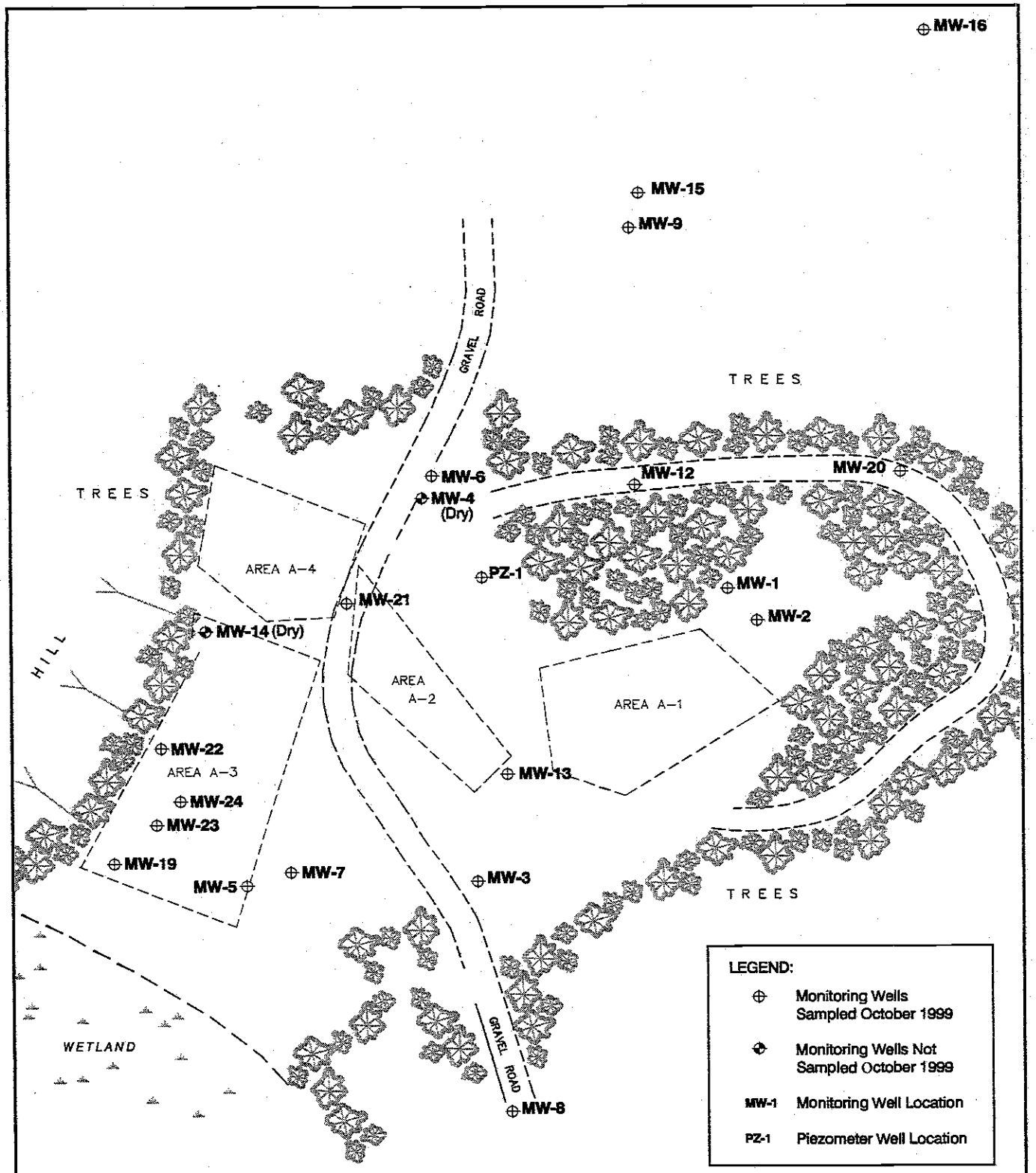


SITE MAP
GROUNDWATER MONITORING WELLS
POLELINE ROAD DISPOSAL AREA
OUB, FORT RICHARDSON, ALASKA

URS Greiner Woodward Clyde

Dwg: 99OCT3_3	By: AR	Figure: 3-3
Project: 74-F0E9408U.00	Date: 1/3/00	

Monitoring wells selected for sampling during the initial eight rounds of the long-term groundwater monitoring program are shown on the site map (Figure 3-3). The rationale for sampling each well is presented in the *Long-Term Groundwater Monitoring Workplan, Operable Unit B, Poleline Road Disposal Area, Fort Richardson, Alaska* (WC 1997). Field tasks for the fifth round of groundwater monitoring included the following:

- collect headspace readings of vapors in each monitoring well
- measure static water levels
- purge and sample up to 20 monitoring wells for VOCs

Deviations to the workplan were made during the October 1999 sampling round at MW-23 (AP-3985) and MW-24 (AP-3986). The groundwater temperature at these wells was above the operating range of the grundfos pump due to SPSH. Therefore, stainless steel bailers were used to manually purge three well volumes. A peristaltic pump was then used to draw groundwater to the surface through tygon tubing and then through a copper coil packed in snow in order to reduce the groundwater temperature. This design reduced the temperature of the water below ten degrees Centigrade and a sample was collected from the end of the copper tubing.

Groundwater monitoring was conducted in accordance with procedures and protocols presented in Sections 4 through 7 of the *Long-Term Groundwater Monitoring Workplan* and *Addendum No. 1*. Section 5 is the Quality Assurance Project Plan. Section 6 and *Addendum No. 1* describe the management of investigation derived waste, and Section 7 covers health and safety requirements.

Weather conditions were variable during the October 1999 sampling round. Three to six inches of snow covered the ground at the beginning of the round. The temperature ranged from –5 to 30 degrees Centigrade, and winds did not exceed 10 knots. Precipitation, snow, was observed during three days and increased the amount of snow to approximately 1 foot.

Groundwater sampling, headspace measurements, and groundwater levels were measured in 19 monitoring wells. Two monitoring wells, MW-4 (AP-4014) and MW-14 (AP-3746), were not sampled because they were dry. Two quality control duplicate samples were taken, plus one matrix spike/matrix spike duplicate.

5.1 VOLATILE ORGANIC COMPOUNDS

Groundwater samples were collected at OUB from October 25 through November 4, 1999. Degradation pathways of the chemical of concern are drawn out in Figure 5-1. Tables 5-1 through 5-10 summarize the 1999 and historical analytical results for VOCs detected in OUB groundwater samples. Multichem Analytical Services laboratory reports for the October 1999 groundwater sampling are included in Appendix A. Sample results for the VOCs detected in 1999 groundwater samples are presented in the following sections.

5.1.1 Non-Chlorinated VOCs

In October 1999, benzene was detected at MW-21 (AP-3983) at a concentration of 0.0120 milligrams per liter (mg/l). This value is lower than concentrations reported from previous years (Table 5-1). Benzene concentrations have previously been detected at PZ-1 (AP-3989), however, benzene was not detected above the analytical detection limit (DL) of 0.0010 mg/l at this well in October 1999.

Toluene concentrations were not detected above the DL of 0.0010 mg/l in any October 1999 water samples. Toluene was previously detected in November 1997, at MW-6 (AP-4016) at a concentration of 0.001 mg/l. Toluene was detected at concentrations ranging from 0.00018-0.00073 mg/l in October 1995 at MW-13 (AP-3745), MW-15 (AP-3747), and MW-9 (AP-4019).

5.1.2 Chlorinated VOCs

Bromodichloromethane concentrations were not detected above the DL of 0.0010 mg/l in any October 1999 water samples. Bromodichloromethane was previously detected in November 1997, at MW-12 (AP-3744) at a concentration 0.002 mg/l.

Chlorobenzene concentrations were not detected above the DL of 0.000 mg/l in any October 1999 water samples. Chlorobenzene was previously detected in November 1997 and October 1998 at MW-22 (AP-3984) at concentrations of 0.001 mg/l and 0.002 mg/l respectively. In October 1995, at MW-13 (AP-3745) and MW-9 (AP-4019), Chlorobenzene was detected at concentrations of 0.00038 mg/l and 0.00055 mg/l respectively.

In October 1999, carbon tetrachloride concentrations were detected in three wells (Table 5-2). MW-1 (AP-4011) had a concentration of 0.0010 mg/l, and MW-15 (AP-3747) and MW-22 (AP-3984) were 0.003 mg/l. In March 1999, carbon tetrachloride was also detected in MW-15 (AP-3747) at 0.003 mg/l.

Chloroform was detected in seven monitoring wells in October 1999 at concentrations ranging from 0.0010 - 0.0120 mg/l (Table 5-3). In March 1999, chloroform was detected at MW-1 (AP-4011) and MW-3 (AP-4013), however, chloroform was not detected above the DL of 0.0010 mg/l at these wells in October 1999. Concentrations of chloroform in October 1999, were similar to concentrations detected in previous years at PZ-1 (AP-3989), MW-5 (AP-4015), and

MW-7 (AP-4017). Concentrations at wells MW-15 (AP-3747), MW-21 (AP-3983), MW-22 (AP-3984), and MW-23 (AP-3985) have not consistently increased or decreased over time.

Tetrachloroethene was detected at eight monitoring wells in October 1999, at concentrations ranging from 0.0020 - 0.1200 mg/l (Table 5-4). Tetrachloroethene concentrations detected in October 1999, were lower than concentrations reported in previous years at MW-21 (AP-3983), MW-22 (AP-3984), MW-23 (AP-3985), MW-24 (AP-3986), PZ-1 (AP-3989), and MW-5 (AP-4015). Tetrachloroethene concentrations have previously been detected at MW-19 (AP-3981), however tetrachloroethene was not detected above the DL of 0.0010 mg/l in October 1999. Concentrations of tetrachloroethene at MW-15 (AP-3745) and MW-7 (AP-4017) were similar to concentrations detected in previous years.

Concentrations of 1,1,2,2-tetrachloroethane were detected in sixteen monitoring wells in October 1999, at concentrations ranging from 0.0010 – 14.000 mg/l (Table 5-5). 1,1,2,2-tetrachloroethane concentrations detected in October 1999, were lower than concentrations reported in previous years at MW-20 (AP-3982), MW-21 (AP-3983), MW-22 (AP-3984), MW-23 (AP-3985), MW-24 (AP-3986), and PZ-1 (AP-3989). In October 1999, concentrations were similar to previous years at MW-2 (AP-4012), MW-5 (AP-4015), MW-1 (AP-4011), MW-6 (AP-4016), and MW-7 (AP-4017). 1,1,2,2-tetrachloroethene concentrations in October 1999, increased compared to concentrations detected since 1998 at MW-3 (AP-4013), MW-12 (AP-3744), MW-13 (AP-3745), MW-15 (AP-3747), and MW-19 (AP-3981).

1,1,2-trichloroethane is a breakdown product of 1,1,2,2-tetrachlorethane. 1,1,2-trichloroethane was detected in ten monitoring wells in October 1999 at concentrations ranging from 0.0010-0.1200 mg/l (Table 5-6). 1,1,2-trichloroethane concentrations detected in October 1999 were lower than concentrations reported in previous years at MW-21 (AP-3983), MW-22 (AP-3984), MW-23 (AP-3985), MW-24 (AP-3986), and PZ-1 (AP-3989). Concentration of 1,1,2-trichloroethene at MW-15 (AP-3747) and MW-7 (AP-4017) in October 1999 were similar to concentrations detected in previous years.

Trichloroethene (TCE) can be a breakdown product of tetrachloroethene or 1,1,2,2-tetrachloroethane. TCE concentrations were detected in 15 monitoring wells in October 1999 (Table 5-7). Concentrations of TCE were lower in October 1999 than in previous years at wells MW-19 (AP-3981), MW-20 (AP-3982), MW-22 (AP-3984), MW-23 (AP-3985), MW-24 (AP-3986), PZ-1 (AP-3989), and MW-6 (AP-4016). TCE concentrations were generally lower at MW-21 (AP-3983) and MW-5 (AP-4015). Concentrations of TCE at MW-1 (AP-4011) and MW-7 (AP-4017) in October 1999 were similar to concentrations detected in previous years. TCE concentrations at MW-3 (AP-4013), MW-12 (AP-3744), MW-13 (AP-3745), and MW-15 (AP-3747) have increased compared to concentrations detected since 1998.

The breakdown of TCE produces three analytes: 1,1-dichloroethene, cis 1,2-dichlorothene, and trans 1,2-dichlorothene. 1,1-dichlorothene concentrations were detected at six monitoring wells in October 1999 ranging from 0.0010 - 0.0330 mg/l (Table 5-8). 1,1-dichloroethene was previously detected at PZ-1 (AP-3989), however, concentrations were not detected above the DL of 0.0010 mg/l in October 1999. 1,1-dichloroethene concentrations at MW-5 (AP-4015), MW-7 (AP-4017), and MW-21 (AP-3983) were similar to concentrations detected in previous years. MW-19 (AP-3981) and MW-23 (AP-3985) had detectable 1,1-dichloroethene concentrations in

October 1999 but concentrations were not detected above the DL of 0.0010 mg/l and 0.0100 mg/l respectively, in March 1999. MW-24 (AP-3986) 1,1-dichloroethene concentrations were higher in October 1999 than those detected in October 1998 and March 1999.

Total 1,2-dichlorothene, a combination of the cis and trans forms, concentrations were detected in 12 monitoring wells in October 1999 ranging from 0.0030 – 2.9800 mg/l (Table 5-9). Concentrations of total 1,2-dichlorothene in October 1999 were lower than levels detected in 1997 at wells MW-22 (AP-3984) and PZ-1 (AP-3989). In October 1999 the total 1,2-dichlorothene concentration at MW-6 (AP-4016) was not detected at 0.001 mg/l, previously the concentration was similar to concentrations detected in previous years. Concentrations of total 1,2-dichlorothene at MW-12 (AP-3744), MW-21 (AP-3983), MW-23 (AP-3985), MW-24 (AP-3986), MW-1 (AP-4011), and MW-7 (AP-4017) in October 1999 were also similar to concentrations detected in previous years. Total 1,2-dichlorothene concentrations at MW-3 (AP-4013) increased overall, but was not detected at the DL of 0.0010 mg/l in October 1998 and March 1999. Concentration of 1,2-dichlorothene at MW-15 (AP-3747), MW-19 (AP-3981), and MW-5 (AP-4015) in October 1999 were similar to concentrations detected in previous years.

Vinyl chloride is a breakdown product of dichloroethene, 1,1-dichloroethene, and 1,2-dichloroethene (total). Vinyl chloride concentrations were detected in four monitoring wells in October 1999 ranging from 0.00120 – 0.00420 mg/l (Table 5-10). In October 1998 and March 1999, vinyl chloride was detected at MW-21 (AP-3983) at a concentration of 0.002 mg/l and 0.009 mg/l respectively. Vinyl chloride concentrations have not been previously detected at MW-23 (AP-3985), MW-24 (AP-3986), or MW-5 (AP-4015).

Monitoring well groundwater sample identification numbers are listed in Table 5-11. Groundwater samples from 14 of the 19 monitoring wells sampled in October 1999 contained one or more compounds that exceeded Alaska maximum contaminant levels (MCL). Table 5-12 summarizes the monitoring wells with MCL excedances.

5.2 NATURAL ATTENUATION AT OUB

The Technical Memorandum for the June 1998 sampling round concluded that minimal biodegradation of chlorinated solvents was occurring at the site and that any decreases are likely the result of physical processes such as dilution, dispersion, hydrolysis and volatilization (WC 1998). Based on this conclusion, groundwater samples collected since June 1998 were not analyzed for natural attenuation parameters.

5.3 HEADSPACE MEASUREMENTS

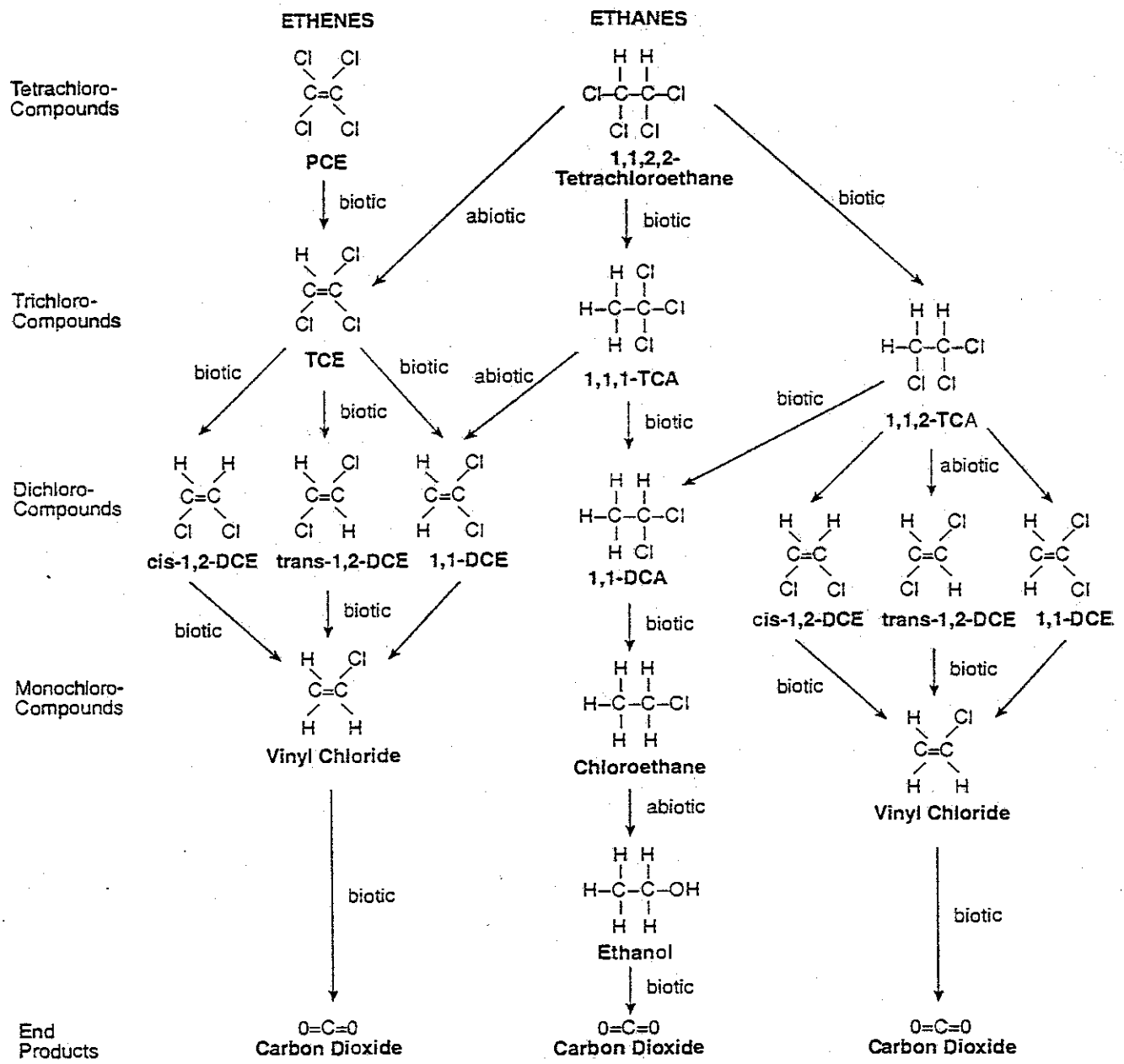
Headspace measurements were recorded at 22 monitoring wells (Table 5-13). Measurements using an organic vapor monitor showed no volatile organic vapors in the headspace of 11 monitoring wells. The remaining 11 monitoring wells had headspace values ranging from 1.0 – 58.6 parts per million (ppm).

5.4 GROUNDWATER ELEVATION

Table 5-14 summarizes OUB monitoring well water level measurements. The first groundwater samples were collected November 1995, which was at the end of a wet summer and fall.

Groundwater level measurements were collected every month starting November 1, 1995 and ending October 2, 1996. Water level measurements were also collected during each groundwater sampling round.

The concentration of contaminants detected in several of the shallow monitoring wells has decreased from November 1997 to October 1999. One explanation is that the concentrations are varying seasonally. It is also suspected that dilution could be influencing the concentration change. Spring runoff and summer rains raise the water table, diluting the contaminant concentrations. The frozen ground in the winter prevents surface water infiltration, causing contaminants to concentrate.



DEGRADATION PATHWAYS OF CHEMICALS OF CONCERN
POLELINE ROAD DISPOSAL AREA
OUB, FORT RICHARDSON, ALASKA

URS Greiner Woodward Clyde

Dwg: FIG5-1.AI	*By:* AR	*Figure:* 5-1
Project: E9408U	*Date:* 3/31/99	

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TABLE 5-1

BENZENE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
					benzene			
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	**0.00034**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**0.094**	**0.021**	**0.021**	**0.033**	**0.0120**
MW-22	AP-3984	--	--	**0.009**	**0.004**	**0.017**	ND (0.010)	ND (0.0010)
MW-23	AP-3985	--	--	--	**0.001**	**0.002**	ND (0.010)	ND (0.0010)
MW-24	AP-3986	--	--	--	--	**0.004**	--	ND (0.0010)
PZ-1	AP-3989	--	ND (0.10)	**0.022**	**0.002**	**0.003**	**0.002**	ND (0.0010)
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**2.9**	**3.3**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	**0.0013**	**0.004**	ND (0.001)	ND (0.001)	ND (0.010)	ND (0.0010)
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	ND (0.2)	--	--	**0.002**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-6	AP-4016	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.02)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-9	AP-4019	**0.00073**	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-2

CARBON TETRACHLORIDE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		carbon tetrachloride						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.022**	**0.0011**	**0.002**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	**0.00038**	ND (0.0010)	**0.003**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.0014**	--	ND (0.001)	ND (0.001)	ND (0.001)	**0.003**	**0.0030**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	ND (0.020)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-22	AP-3984	--	--	**0.011**	**0.010**	**0.006**	ND (0.010)	**0.0030**
MW-23	AP-3985	--	--	--	ND (0.001)	ND (0.001)	ND (0.010)	ND (0.0010)
MW-24	AP-3986	--	--	--	--	ND (0.001)	--	ND (0.0010)
PZ-1	AP-3989	--	ND (0.10)	ND (0.020)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**2.6**	**2.7**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.010)	ND (0.0010)
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	ND (0.2)	--	--	**0.009**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.002)	--	ND (0.001)	**0.001**	ND (0.001)	ND (0.001)	**0.0010**
MW-6	AP-4016	ND (0.002)	--	**0.001**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.02)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-9	AP-4019	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-3

CHLOROFORM
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		chloroform						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	**0.00053**	--	ND (0.001)	ND (0.001)	ND (0.001)	**0.013**	ND (0.0010)
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	ND (0.0002)	ND (0.0010)	**0.002**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	**0.0011**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.0016**	--	**0.002**	ND (0.001)	**0.001**	**0.004**	**0.0090**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.001**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**0.078**	**0.028**	**0.016**	**0.023**	**0.0120**
MW-22	AP-3984	--	--	**0.012**	**0.001**	**0.010**	ND (0.010)	**0.0010**
MW-23	AP-3985	--	--	--	**0.003**	**0.004**	ND (0.010)	**0.0010**
MW-24	AP-3986	--	--	--	--	**0.006**	--	ND (0.0010)
PZ-1	AP-3989	--	ND (0.10)	ND (0.020)	**0.003**	**0.003**	**0.003**	**0.0020**
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**1.4**	ND (1.0)	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	**0.0059**	**0.010**	**0.003**	**0.003**	ND (0.010)	**0.0020**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	ND (0.2)	--	--	**0.009**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.002)	--	ND (0.001)	ND (0.001)	**0.006**	**0.004**	ND (0.0010)
MW-6	AP-4016	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.02)	--	**0.001**	**0.002**	**0.001**	**0.002**	**0.0010**
MW-9	AP-4019	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-4

TETRACHLOROETHENE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		tetrachloroethene						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.00035**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.0021**	--	**0.002**	**0.001**	**0.003**	**0.006**	**0.0060**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.018**	**0.002**	**0.005**	**0.007**	ND (0.0010)
MW-20	AP-3982	--	--	ND (0.001)	0.001	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**0.390**	**0.170**	**0.140**	**0.160**	**0.1200**
MW-22	AP-3984	--	--	**0.300**	**0.084**	**0.150**	**0.062**	**0.0290**
MW-23	AP-3985	--	--	--	**0.052**	**0.086**	**0.072**	**0.0010**
MW-24	AP-3986	--	--	--	--	**0.150**	--	**0.0090**
PZ-1	AP-3989	--	ND (0.10)	**0.073**	**0.010**	**0.010**	**0.013**	**0.0050**
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**11**	**12.3**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	**0.067**	**0.130**	**0.029**	**0.032**	**0.059**	**0.0380**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	**0.310**	--	--	**0.084**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-6	AP-4016	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.02)	--	**0.004**	**0.005**	**0.003**	**0.004**	**0.0020**
MW-9	AP-4019	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999

-- = Not Sampled

ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-5

1,1,2,2-TETRACHLOROETHANE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		1,1,2,2-tetrachloroethane						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.50)	ND (0.0010)	0.003	0.001	0.004	ND (0.001)	0.0010
MW-3	AP-4013	0.5400	--	0.450	0.035	0.059	0.080	0.4100
MW-8	AP-4018	ND (0.50)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	0.4900	0.024	0.065	0.014	0.130	0.019	0.0360
MW-13	AP-3745	0.0011	0.0011	0.009	0.058	0.056	0.004	0.1300
MW-15	AP-3747	0.0063	--	0.004	0.002	0.004	0.012	0.0130
MW-17	AP-3749	--	--	ND (0.001)	--	--	0.001	--
MW-19	AP-3981	--	--	1.400	0.340	0.630	0.690	0.8500
MW-20	AP-3982	--	--	0.010	0.150	0.120	0.059	0.0400
MW-21	AP-3983	--	--	62.000	24.000	3.800	26.000	15.0000
MW-22	AP-3984	--	--	11.000	3.700	15.000	2.800	0.8100
MW-23	AP-3985	--	--	--	17.000	18.000	17.000	0.1000
MW-24	AP-3986	--	--	--	--	47.000	--	0.0260
PZ-1	AP-3989	--	1.40	19.000	1.000	3.300	1.800	0.8300
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	1900	1000	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	21	9.1	19.000	15.000	6.000	10.000	14.0000
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	71	--	--	6.000	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	0.082	--	0.047	0.054	0.029	0.018	0.0470
MW-6	AP-4016	0.520	--	0.006	0.013	0.019	0.005	0.0130
MW-7	AP-4017	3.100	--	1.500	1.800	1.500	0.950	1.5000
MW-9	AP-4019	ND (0.50)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-6

1,1,2-TRICHLOROETHANE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		1,1,2-trichloroethane						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.50)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	**0.0023**	--	**0.004**	ND (0.001)	ND (0.001)	ND (0.001)	**0.0020**
MW-8	AP-4018	ND (0.50)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.00078**	ND (0.0010)	**0.002**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	ND (0.50)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.0013**	--	**0.003**	ND (0.001)	**0.002**	**0.005**	**0.0040**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.014**	ND (0.001)	**0.003**	**0.005**	**0.0200**
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**0.420**	**0.19**	**0.200**	**0.180**	**0.1200**
MW-22	AP-3984	--	--	**0.043**	**0.011**	**0.410**	ND (0.010)	**0.0040**
MW-23	AP-3985	--	--	--	**0.076**	**0.077**	**0.070**	**0.0010**
MW-24	AP-3986	--	--	--	--	**0.150**	--	**0.0080**
PZ-1	AP-3989	--	ND (0.10)	**0.120**	**0.009**	**0.022**	**0.015**	**0.0080**
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	ND (1.3)	**1.0**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.50)	**0.45**	**0.100**	**0.025**	**0.031**	**0.059**	**0.0210**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	ND (0.50)	--	--	**0.036**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.005)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-6	AP-4016	ND (0.005)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.05)	--	**0.024**	**0.028**	**0.020**	**0.021**	**0.0210**
MW-9	AP-4019	ND (0.50)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.50)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-7

TRICHLOROETHENE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		trichloroethene						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	**0.001**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	**0.2600**	--	**0.270**	**0.037**	**0.062**	**0.110**	**0.2400**
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.1600**	**0.070**	**0.190**	**0.058**	**0.063**	**0.058**	**0.0790**
MW-13	AP-3745	**0.0067**	0.0041	**0.018**	**0.008**	**0.010**	**0.007**	**0.0120**
MW-15	AP-3747	**0.2700**	--	**0.320**	**0.140**	**0.260**	**0.730**	**0.8700**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.950**	**0.110**	**0.170**	**0.280**	**0.0210**
MW-20	AP-3982	--	--	**0.012**	**0.018**	**0.012**	**0.017**	**0.0010**
MW-21	AP-3983	--	--	**22.000**	**12.000**	**1.100**	**12.000**	**9.1000**
MW-22	AP-3984	--	--	**8.700**	**2.100**	**7.800**	**1.700**	**1.6000**
MW-23	AP-3985	--	--	--	**2.200**	**3.200**	**3.100**	**0.9700**
MW-24	AP-3986	--	--	--	--	**3.700**	--	**0.9700**
PZ-1	AP-3989	--	**0.94**	**5.400**	**0.930**	**1.300**	**0.740**	**0.6800**
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**220**	**186**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	**4.8**	**3.1**	**8.000**	**3.000**	**3.700**	**5.400**	**3.4000**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	**14.000**	--	--	**4.100**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	**0.043**	--	**0.030**	**0.034**	**0.029**	**0.035**	**0.0340**
MW-6	AP-4016	**0.130**	--	**0.086**	**0.025**	**0.026**	**0.073**	**0.0200**
MW-7	AP-4017	**1.000**	--	**1.300**	**0.920**	**0.850**	**1.100**	**0.8600**
MW-9	AP-4019	**0.00091**	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP3748	**0.00031**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-8

1,1-DICHLOROETHENE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		1,1-dichloroethene						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	ND (0.00019)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.00014**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	**0.00026**	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.00071**	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.002**	ND (0.001)	ND (0.001)	ND (0.001)	**0.0030**
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**0.032**	**0.014**	**0.019**	**0.018**	**0.0330**
MW-22	AP-3984	--	--	**0.010**	ND (0.001)	**0.007**	ND (0.010)	ND (0.0010)
MW-23	AP-3985	--	--	--	ND (0.001)	**0.004**	ND (0.010)	**0.0010**
MW-24	AP-3986	--	--	--	--	**0.005**	--	**0.0140**
PZ-1	AP-3989	--	ND (0.10)	ND (0.020)	ND (0.001)	**0.003**	**0.002**	ND (0.0010)
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	ND (0.5)	ND (1.0)	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	ND (0.0010)	**0.010**	ND (0.001)	**0.005**	ND (0.010)	**0.0100**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	ND (0.2)	--	--	**0.003**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-6	AP-4016	ND (0.002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.02)	--	**0.004**	**0.003**	**0.005**	**0.005**	**0.0030**
MW-9	AP-4019	**0.0012**	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-9

1,2-DICHLOROETHENE (TOTAL)
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B								
		1,2-dichloroethene (Total)						
Well ID	API No.	Oct 1995	Nov 1996	Nov 1997	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER								
MW-2	AP-4012	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	**0.012**	--	**0.046**	**0.005**	ND (0.001)	**0.033**	**0.0380**
MW-8	AP-4018	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	**0.001**	**0.0029**	**0.015**	**0.003**	ND (0.001)	**0.002**	**0.0030**
MW-13	AP-3745	ND (0.0002)	ND (0.0010)	**0.001**	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	**0.019**	--	**0.028**	**0.010**	**0.021**	**0.044**	**0.0490**
MW-17	AP-3749	--	--	ND (0.001)	--	--	ND (0.001)	--
MW-19	AP-3981	--	--	**0.075**	**0.020**	**0.016**	**0.020**	**0.3480**
MW-20	AP-3982	--	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	--	--	**5.100**	**1.970**	**2.920**	**3.500**	**2.9800**
MW-22	AP-3984	--	--	**0.710**	**0.208**	**0.920**	**0.240**	**0.0730**
MW-23	AP-3985	--	--	--	**0.193**	**0.208**	**0.324**	**0.3360**
MW-24	AP-3986	--	--	--	--	**0.307**	--	**0.3800**
PZ-1	AP-3989	--	**0.170**	**1.100**	**0.128**	**0.315**	**0.220**	**0.1260**
WELL SCREENED IN PERCHED AQUIFER								
MW-14	AP-3746	**49.000**	**5.900**	--	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER								
MW-5	AP-4015	ND (0.2)	**0.330**	**0.650**	**0.256**	**0.500**	**0.860**	**1.3100**
WELL SCREENED IN INTERMEDIATE AQUIFER								
MW-4	AP-4014	**2.000**	--	--	**0.405**	--	--	--
WELL SCREENED IN DEEP AQUIFER								
MW-1	AP-4011	**0.0053**	--	**0.004**	**0.005**	**0.006**	ND (0.001)	**0.0040**
MW-6	AP-4016	**0.0035**	--	**0.004**	**0.002**	**0.002**	**0.003**	ND (0.0010)
MW-7	AP-4017	**0.3400**	--	**0.380**	**0.382**	**0.384**	**0.455**	**0.3490**
MW-9	AP-4019	ND (0.0002)	--	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.0002)	ND (0.0010)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-10

VINYL CHLORIDE
SUMMARY OF ANALYTICAL RESULTS
OPERABLE UNIT B, FORT RICHARDSON, ALASKA

Volatile Organic Compounds Detected (mg/l) in Groundwater Samples Using EPA Method 8260B					
		vinyl chloride			
Well ID	API No.	June 1998	Oct 1998	Mar 1999	Oct 1999
WELLS SCREENED IN SHALLOW AQUIFER					
MW-2	AP-4012	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-3	AP-4013	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-8	AP-4018	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-12	AP-3744	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-13	AP-3745	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-15	AP-3747	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-17	AP-3749	--	--	ND (0.001)	--
MW-19	AP-3981	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-20	AP-3982	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-21	AP-3983	ND (0.001)	**0.009**	**0.002**	**0.0042**
MW-22	AP-3984	ND (0.001)	ND (0.001)	ND (0.010)	ND (0.0010)
MW-23	AP-3985	ND (0.001)	ND (0.001)	ND (0.010)	**0.0031**
MW-24	AP-3986	ND (0.001)	ND (0.001)	--	**0.0028**
PZ-1	AP-3989	ND (0.001)	ND (0.100)	ND (0.001)	ND (0.0010)
WELL SCREENED IN PERCHED AQUIFER					
MW-14	AP-3746	--	--	--	--
WELL SCREENED IN SHALLOW-INTERMEDIATE AQUIFER					
MW-5	AP-4015	ND (0.001)	ND (0.001)	ND (0.010)	**0.0012**
WELL SCREENED IN INTERMEDIATE AQUIFER					
MW-4	AP-4014	ND (0.001)	--	--	--
WELL SCREENED IN DEEP AQUIFER					
MW-1	AP-4011	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-6	AP-4016	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-7	AP-4017	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-9	AP-4019	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)
MW-16	AP-3748	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.0010)

NOTES: MW-14 was dry in 1997, 1998, and 1999
-- = Not Sampled
ND = Analyte Not Detected (Detection Limit in Parentheses)

TABLE 5-11

SAMPLE CROSS REFERENCE SHEET
OCTOBER 1999 GROUNDWATER SAMPLES

OPERABLE UNIT B, POLELINE ROAD DISPOSAL AREA FORT RICHARDSON, ALASKA				
Well ID	API Number	Field Sample ID	Laboratory Sample ID	Sample Type
MW-16	AP-3748	99PRDA-106-GW	821867-1	ES
MW-8	AP-4018	99PRDA-107-GW	821867-2	ES
MW-9	AP-4019	99PRDA-108-GW	821875-1	ES
MW-2	AP-4012	99PRDA-109-GW	821875-2	ES
MW-13	AP-3745	99PRDA-110-GW	821875-3	ES
MW-6	AP-4016	99PRDA-111-GW	821875-4	ES
MW-15	AP-3747	99PRDA-112-GW	821875-5	ES
MW-1	AP-4011	99PRDA-113-GW	821875-6	ES
MW-12	AP-3744	99PRDA-114-GW	821875-7	ES
MW-20	AP-3982	99PRDA-115-GW	821878-1	ES
MW-20	AP-3982	99PRDA-116-GW	821878-2	Blind-Dup
MW-3	AP-4013	99PRDA-117-GW	821878-3	ES/MS/MSD
MW-19	AP-3981	99PRDA-118-GW	821878-4	ES
MW-7	AP-4017	99PRDA-119-GW	821878-5	ES
MW-7	AP-4017	99PRDA-120-GW	821878-6	Blind-Dup
PZ-1	AP-3989	99PRDA-121-GW	821878-7	ES
MW-22	AP-3984	99PRDA-122-GW	821878-8	ES
MW-5	AP-4015	99PRDA-123-GW	821878-9	ES
MW-21	AP-3983	99PRDA-124-GW	821878-10	ES
MW-23	AP-3985	99PRDA-125-GW	821879-1	ES
MW-24	AP-3986	99PRDA-126-GW	821879-2	ES

Notes: Blind-Dup: Blind duplicate using false sample collection time
ES: Environmental sample
MS/MSD: Matrix spike/matrix spike duplicate

TABLE 5-12

VOLATILE ORGANIC COMPOUNDS THAT EXCEEDED MCLS
OCTOBER 1999 GROUNDWATER SAMPLES

OPERABLE UNIT B, POLELINE ROAD DISPOSAL AREA FORT RICHARDSON, ALASKA				
Compound	MCL (mg/L)	Concentration* (mg/L)	Monitoring Well ID	API No.
benzene	0.005	0.012	MW- 21	AP-3983
1,2-dichloroethene (total cis and trans)	0.07**	1.310	MW-5	AP-4015
		0.349	MW-7	AP-4017
		0.348	MW-19	AP-3981
		2.98	MW-21	AP-3983
		0.073	MW-22	AP-3984
		0.336	MW-23	AP-3985
		0.380	MW-24	AP-3986
		0.126	PZ-1	AP-3989
1,1-dichloroethene	0.007	0.010	MW-5	AP-4015
		0.033	MW-21	AP-3983
		0.014	MW-24	AP3986
tetrachloroethene	0.005	0.038	MW-5	AP-4015
		0.006	MW-15	AP-3747
		0.120	MW-21	AP-3983
		0.029	MW-22	AP-3984
		0.009	MW-24	AP-3986
		0.005	PZ-1	AP-3989
trichloroethene	0.005	0.034	MW-1	AP-4011
		0.240	MW-3	AP-4013
		3.4	MW-5	AP-4015
		0.020	MW-6	AP-4016
		0.860	MW-7	AP-4017
		0.079	MW-12	AP-3744
		0.012	MW-13	AP-3745
		0.870	MW-15	AP-3747
		0.021	MW-19	AP-3981
		9.1	MW-21	AP-3983
		1.6	MW-22	AP-3984
		0.970	MW-23	AP-3985
		0.970	MW-24	AP-3986
		0.680	PZ-1	AP-3989

NOTES:

mg/L = milligram per liter

* Only those concentrations that exceed Maximum Contaminant Levels (MCLs) are shown

** Analysis did not separate cis- and trans-dichloroethene which have MCLs of 0.07 and 0.1 ppm , respectively

TABLE 5-13

MONITORING WELL HEADSPACE VALUES
OCTOBER 1999 GROUNDWATER SAMPLES

OPERABLE UNIT B FORT RICHARDSON, ALASKA			
Monitoring Well	API No.	Saturated Interval API No.	Headspace Measurement (ppm)
MW-2	AP-4012	Shallow	0.0
MW-3	AP-4013	Shallow	0.0
MW-8	AP-4018	Shallow	0.0
MW-12	AP-3744	Shallow	0.0
MW-13	AP-3745	Shallow	0.0
MW-15	AP-3747	Shallow	1.5
MW-17	AP-3749	Shallow	0.0
MW-19	AP-3981	Shallow	6.0
MW-20	AP-3982	Shallow	0.0
MW-21	AP-3983	Shallow	7.0
MW-22	AP-3984	Shallow	40.5
MW-23	AP-3985	Shallow	58.6
MW-24	AP-3986	Shallow	25.5
PZ-1	AP-3989	Shallow	0.0
MW-14	AP-3746	Perched	16.0
MW-5	AP-4015	Shallow-Intermediate	7.0
MW-4	AP-4014	Intermediate	49.0
MW-1	AP-4011	Deep	0.0
MW-6	AP-4016	Deep	0.0
MW-7	AP-4017	Deep	1.0
MW-9	AP-4019	Deep	3.0
MW-16	AP-3748	Deep	0.0

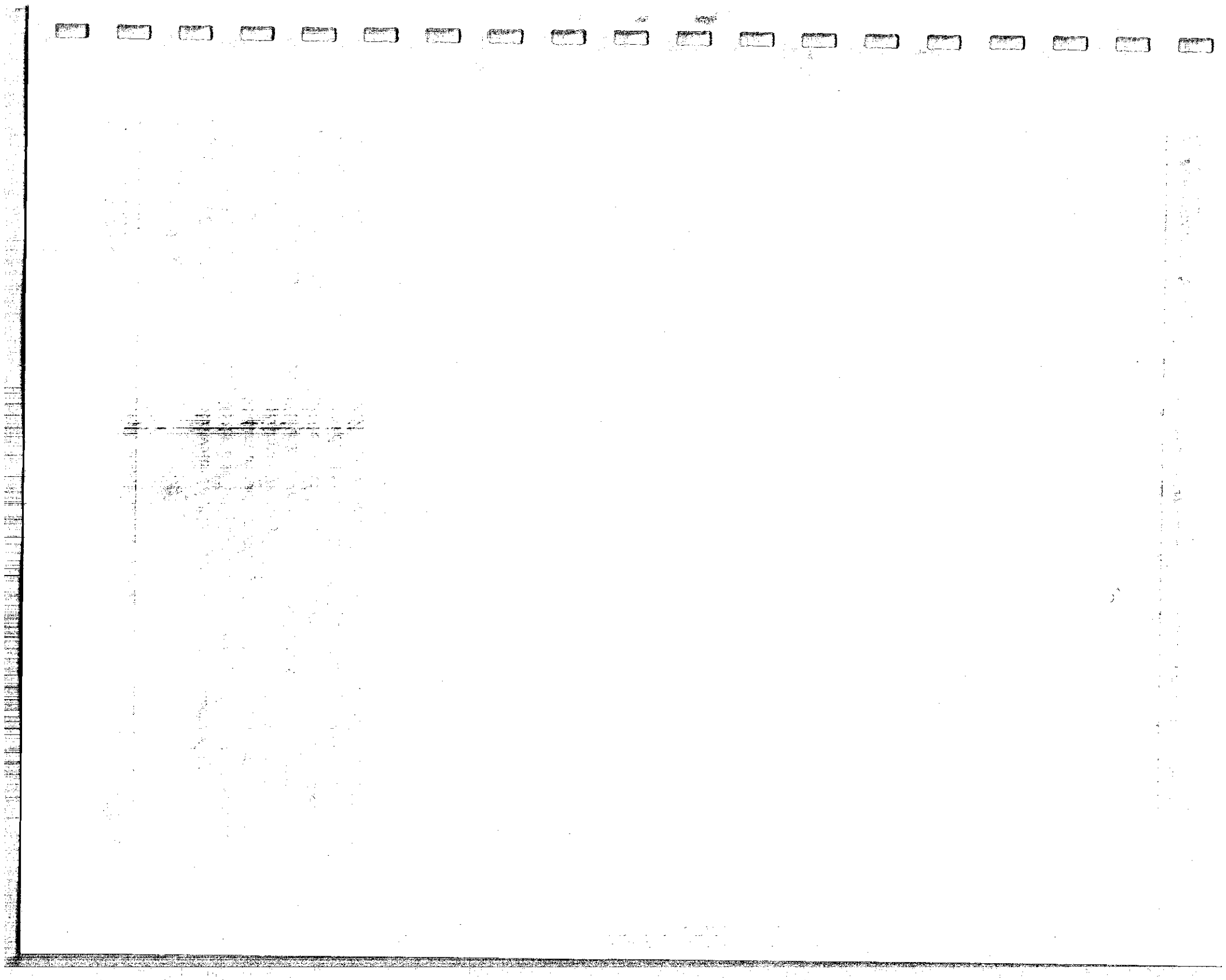
TABLE 5-14
GROUNDWATER ELEVATIONS POLELINE ROAD DIPOSAL AREA

OPERABLE UNIT B FORT RICHARDSON, ALASKA			Groundwater Elevation in Feet																	
Monitoring Well	API No.	Saturated Interval API No.	11/01/95	12/04/95	01/03/96	02/01/96	03/01/96	04/01/96	05/01/96	06/03/96	07/01/96	08/02/96	09/03/96	10/02/96	11/4/96	11/10/97	6/8/98	10/21/98	3/11/99	10/21/99
MW-2	AP-4012	Shallow	274.11	273.43	272.69	272.30	272.08	271.88	271.62	271.80	271.76	271.61	271.37	271.22	271.01	273.31	275.22	273.97	273.48	272.69
MW-3	AP-4013	Shallow	274.01	272.84	271.55	270.78	269.97	269.49	269.33	269.42	269.41	269.38	269.28	269.26	NS	272.56	275.05	274.30	271.06	271.86
MW-8	AP-4018	Shallow	276.67	276.04	275.20	274.61	274.15	273.84	273.59	273.65	273.60	273.53	273.45	273.34	NS	275.35	277.16	276.45	273.56	274.59
MW-12	AP-3744	Shallow	273.75	273.04	272.24	271.76	271.38	271.10	270.70	270.92	270.82	270.57	270.29	270.13	269.94	272.84	274.62	273.62	271.50	271.98
MW-13	AP-3745	Shallow	275.88	275.21	274.46	273.90	273.52	273.22	272.98	273.02	272.99	272.96	272.91	272.83	272.73	274.79	276.27	275.72	272.96	274.09
MW-15	AP-3747	Shallow	271.92	270.83	269.83	269.29	268.36	268.22	267.17	267.20	267.03	266.89	266.21	265.74	265.03	271.68	274.67	272.12	268.68	270.00
MW-17	AP-3749	Shallow	285.40	284.54	283.69	283.06	282.59	282.28	282.36	282.70	282.64	282.37	282.15	281.97	281.80	284.86	281.08	284.97	282.33	284.28
MW-19	AP-3981	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	276.82	276.29	277.48	274.64	275.88
MW-20	AP-3982	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	272.33	274.44	273.31	271.4	271.78
MW-21	AP-3983	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	274.15	275.40	275.09	272.4	273.45
MW-22	AP-3984	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	277.27	276.55	277.43	275.51	275.71
MW-23	AP-3985	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	276.05	277.44	274.88	275.88
MW-24	AP-3986	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	276.13	277.27	NS	275.77
PZ-1	AP-3989	Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	271.61	273.91	275.07	274.54	272.34	272.79
MW-14	AP-3746	Perched	290.93	289.93	289.05	288.37	287.71	287.28	288.80	290.38	289.89	289.37	289.08	288.72	288.91	Dry	Dry	285.07	Dry	Dry
MW-5	AP-4015	Shallow-Intermediate	277.44	276.59	275.33	275.15	274.60	274.24	273.85	274.10	274.16	274.00	273.88	273.76	273.64	276.30	276.52	276.93	272.82	275.72
MW-4	AP-4014	Intermediate	237.77	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	238.33	NS	Dry	243.25	Dry	Dry	Dry
MW-1	AP-4011	Deep	173.27	173.26	173.22	173.28	173.18	173.32	Dry	173.29	173.18	173.24	173.18	173.32	NS	173.39	173.35	173.12	173.43	173.62
MW-6	AP-4016	Deep	177.36	177.24	177.40	177.53	177.32	177.68	177.35	177.63	177.33	177.44	177.42	177.71	NS	177.54	177.64	177.28	177.76	177.92
MW-7	AP-4017	Deep	226.71	226.37	226.30	226.38	226.12	226.40	226.08	226.30	225.97	226.09	226.09	226.33	NS	226.53	226.85	227.09	226.65	227.54
MW-9	AP-4019	Deep	Dry	160.16	160.13	159.94	Dry	159.09	Dry	Dry	158.08	158.10	158.08	158.02	NS	NS	157.82	160.21	159.35	158.37
MW-16	AP-3748	Deep	162.38	162.19	162.11	162.11	161.56	161.39	160.51	160.41	160.00	160.17	160.12	160.30	160.00	159.46	160.02	162.20	161.47	160.54

Notes: Dry - Dry well
NA - Not Available
NS - Not Sampled

6.1 CONCLUSIONS

In general, VOC concentrations in groundwater at OUB appear to be slowly decreasing. The decrease in VOC concentrations may be the result of physical processes, previously discussed in Section 5.2, and the SPSH and high vacuum extraction testing. Some secondary or degradation compound concentrations may be increasing as primary VOCs (1,1,2,2-tetrachloroethane, tetrachloroethene, and trichloroethene) break down and produce dichloro-compounds which eventually break down into monochloro-compounds. Several hundred pounds of chlorinated solvents have been removed from the site due to the SPSH and high vacuum processes. Future groundwater sampling will help to identify the impacts of the physical and remediation processes at OUB.



Wiedemeier, T.H., M.A. Swanson, D.E. Moutoux, K. Gordon, J.T. Wilson, B.H. Wilson, D.H. Kampbell, J.E. Hansen, P. Haas, and F.H. Chapelle. 1996. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. U.S. Air Force Center for Environmental Excellence. San Antonio, Texas.

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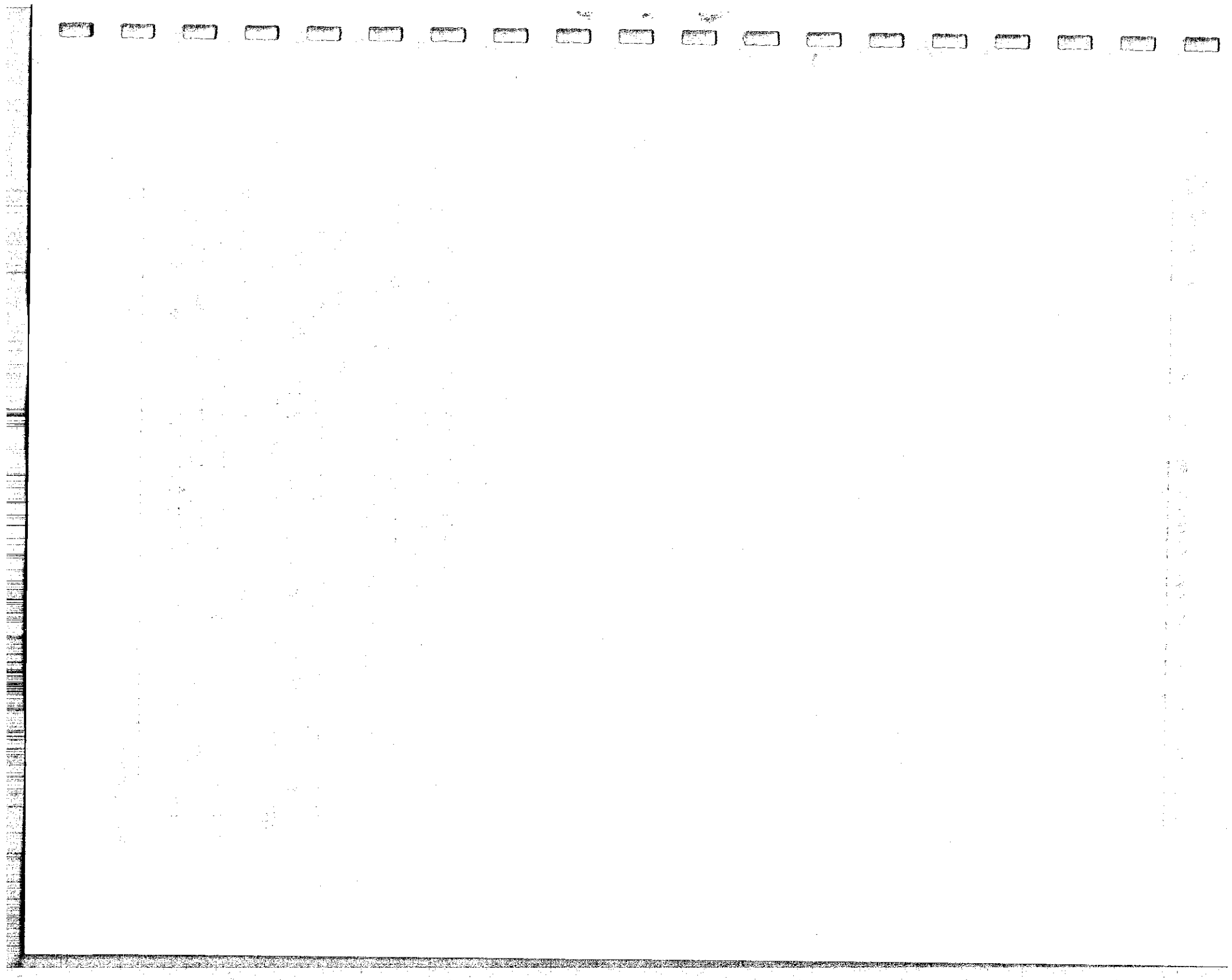
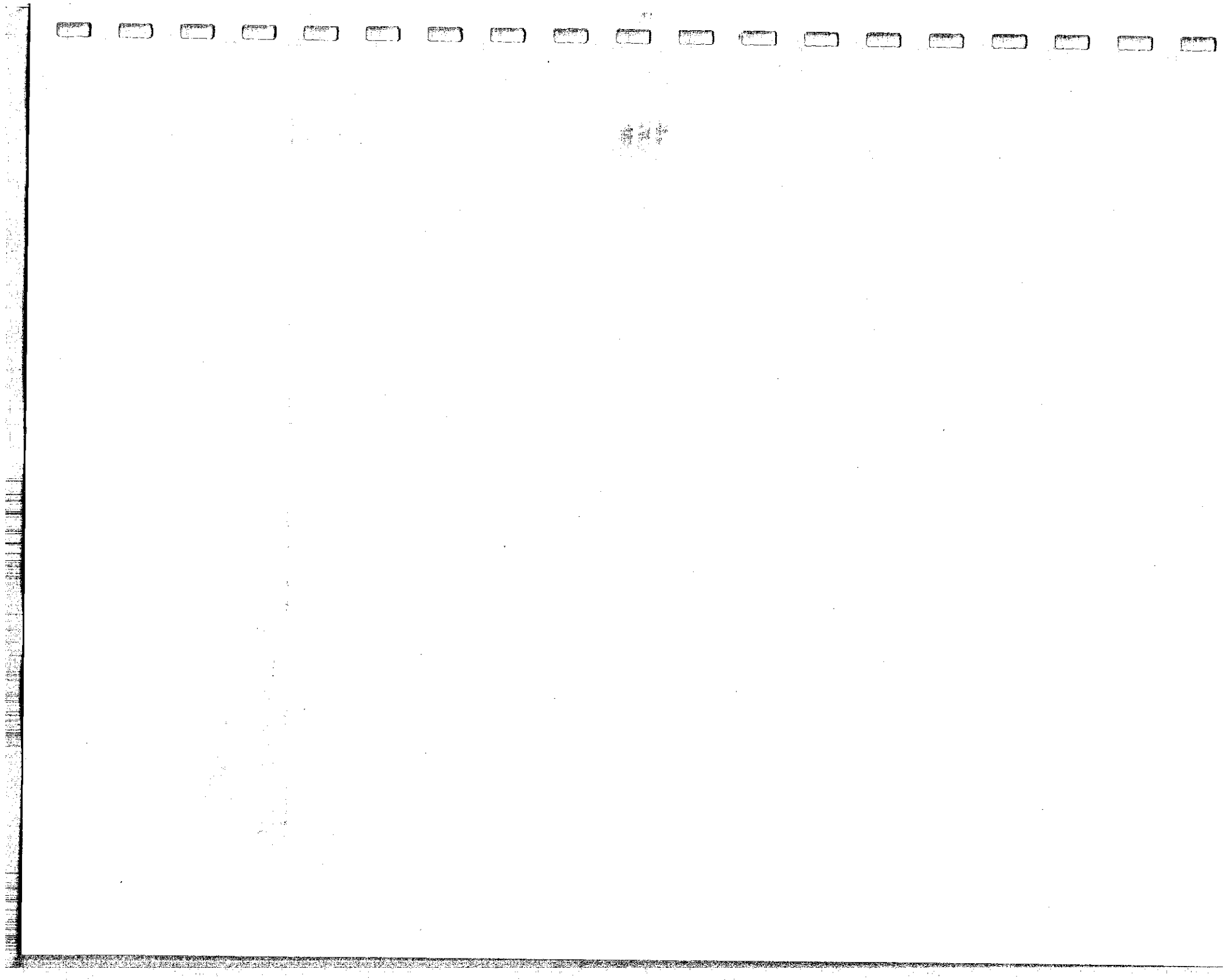


APPENDIX A

Laboratory Reports



MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821867
UST - 026

November 16, 1999

URS Greiner/Woodward-Clyde
3501 Denali Street
Suite 101
Anchorage AK 99503

Attention : Scott Kendall

Project Number : 74F0E9408U/05700

Project Name : OUB Long-Term GW Sampling

Dear Mr. Kendall:

On October 29, 1999, MultiChem Analytical Services received two samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Sincerely,

Gary A. Morelli
Project Manager

GAM/hal/trm

Enclosure

560 Naches Avenue SW, Suite 101, Renton, Washington 98055-2200 • 425-228-8335 • FAX 425-228-8336 • 1-800-609-0580 • info@multichem.com

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

SAMPLE CROSS REFERENCE SHEET

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG-TERM GW SAMPLING

MAS #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
821867-1	99PRDA-106-GW	10/25/99	WATER
821867-2	99PRDA-107-GW	10/25/99	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	2

MAS STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

ANALYTICAL SCHEDULE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG-TERM GW SAMPLING

ANALYSIS	TECHNIQUE	REFERENCE	LAB
VOLATILE ORGANICS ANALYSIS	GCMS	EPA 8260B	R

R = MAS - Renton
ANC = MAS - Anchorage
SUB = Subcontract

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG-TERM GW SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The target compound hexachlorobutadiene was detected in the method blank analyzed on November 5, 1999, at a level above the reporting limit. Since reportable concentrations of hexachlorobutadiene were not detected above the reporting limit in any of the associated samples, no further corrective action was performed.

The matrix spike duplicate (MSD) associated with the samples in this accession was analyzed 15 minutes outside of the 12 hour analysis window. Since the matrix spike (MS) and unspiked sample were analyzed within the analysis window, and all associated MS/MSD recoveries as well as all relative percent difference (RPD) criteria were within MultiChem's established control limits, no further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	3.3
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	109	50 - 150
1,2-DICHLOROETHANE-D4	115	81 - 130
TOLUENE-D8	105	80 - 120
BROMOFLUOROBENZENE	98	75 - 118

MAS I.D. # 821867-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/25/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 10/29/99
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-106-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821867-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/25/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 10/29/99
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-106-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	110	50 - 150
1,2-DICHLOROETHANE-D4	119	81 - 130
TOLUENE-D8	105	80 - 120
BROMOFLUOROBENZENE	103	75 - 118

MAS I.D. # 821867-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/25/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 10/29/99
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-107-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821867-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/25/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 10/29/99
PROJECT NAME	: OUB LONG-TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-107-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	109	50 - 150
1,2-DICHLOROETHANE-D4	122	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	102	75 - 118

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG-TERM GW SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/05/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	43.0	86	N/A	N/A	N/A
BENZENE	<1.00	50.0	44.9	90	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	50.0	100	N/A	N/A	N/A
TOLUENE	<1.00	50.0	50.6	101	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	49.5	99	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	106	N/A	50 - 150
1,2-DICHLOROETHANE-D4	114	N/A	81 - 130
TOLUENE-D8	102	N/A	80 - 120
BROMOFLUOROBENZENE	98	N/A	75 - 118

MAS I.D. # 821867

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG-TERM GW SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : 821867-1
DATE EXTRACTED : N/A
DATE ANALYZED : 11/05/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	44.6	89	44.5	89	0
BENZENE	<1.00	50.0	47.3	95	46.2	92	2
TRICHLOROETHENE	<1.00	50.0	51.8	104	51.7	103	0
TOLUENE	<1.00	50.0	47.3	95	47.1	94	0
CHLOROBENZENE	<1.00	50.0	47.3	95	45.2	90	5

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	72 - 137	20
BENZENE	80 - 133	20
TRICHLOROETHENE	79 - 120	20
TOLUENE	72 - 137	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	110	112	50 - 150
1,2-DICHLOROETHANE-D4	130	127	81 - 130
TOLUENE-D8	97	98	80 - 120
BROMOFLUOROBENZENE	105	106	75 - 118

TO Renton

MultiChem Analytical Services

2000 W. INTL. AIRPORT RD., # C-7
ANCHORAGE, AK 99502
Phone: (907)248-8273 Fax: (907)248-8274

ACCESSION #: 821867

CHAIN OF CUSTODY

COMPANY: URS Greiner Woodward Clyde
ADDRESS: 3501 Denali St., Suite 101
Anchorage, AK 99503
PHONE: (907) 561-1020 FAX: (907) 563-3198
REPORT TO: Scott Kendall
PROJECT NAME: OU8 Long-Term GW Sampling
PROJECT #: 74FOE9408U/05700
MAS WILL: (DISPOSE) / RETURN samples (circle one)

MAS-Alaska Analyses | MAS-WA or Subcontract Analyses

SAMPLE ID	DATE	TIME	MATRIX	LAB #	GRO by 8015M	BTEX by 8021M	GRO&BTEX/8015M/8021M	DRO by 8100M	DRO-EXTENDED by 8100M	GRO by AK101	GRO/BTEX by AK101/8021	DRO by AK102	RRO by AK103	DRO/RRO by AK102/103	Flashpoint/Ignitability	pH	TRPH by 418.1	8260-GC/MS Volatiles	8270-GC/MS Semivolatiles	8081/8082-Pesticides&PCB	PCBs only by 8082	8021-Arom/Halog Volatiles	Total Metals: As,Cd,Cr,Pb	TCLP-RCRA 8 Metals/1311	RCRA 8 Metals	Metals (list below) *	TOC	Total # of Containers
~~99PRDA-105-GW~~ (EAT)	~~10-25-99~~	~~1230~~	~~Water~~															1										3
99PRDA-106-GW	10-25-99	1340	Water	01														1										3
99PRDA-107-GW	10-25-99	1610	Water	02														1										3

Turnaround time (TAT):
STANDARD: ☒
(Winter: 5 WD FAX FUELS, 10 WD OTHER)
RUSH (check one): 24 HR ☐ 48 HR ☐ 72 HR ☐ 1 WK ☐
PURCHASE ORDER #:

Report type :
STANDARD (Level II) ☐
or with Raw Data Pkg.: ADEC ☐ ACOE ☒ CHRO's ☐
Electronic Data Disc (EDD) ☒

Sample Receipt:
TOTAL # CONTAINERS RECEIVED:
COOLER SEALS PRESENT? (N/A) Y N
IF SO, INTACT? N/A Y N
COOLER TEMP: 4.9°C
CONTAINERS REC'D INTACT? Y N
RECEIVED VIA: Hand Carry

Relinquished by:	Relinquished by:
Signature: [signature] Date: 10-27-99	Signature: [signature] Date: 10/27/99
Printed name: Cynthia Tomlinson Time: 12:20	Printed name: V Bayley Time: 1300
Company: URSG/WCC	Company: MAS-AK
Received by:	**Received at Laboratory by:**
Signature: [signature] Date: 10/27/99	Signature: [signature] Date: 10/29/99
Printed name: Lorraine Andela Time: 12:20	Printed name: Delaney Peterson Time: 1450
Company: MultiChem-AK	Company: MASR

SPECIAL INSTRUCTIONS:

* Metals needed (see above):

NON-CONFORMANCES?
Y (N)
(if Y see other side)

MultiChem Analytical Services
SAMPLE LOG-IN CHECKLIST

DATE: 10/29/99
TIME: 1450
INITIALS: DD

ACCESSION NO. 821867
CLIENT: UPSGWC
PROJECT: OU3 LONG-TERM GW SAMPLING

Shipping:

Type:
2 Cooler
___ Box
___ Other

COC Seals:
X Ship. Cont.
___ On Bottles
___ None

Intact?
(Y) N
Y N

Packing Material:
___ Styrofoam
X Bubble Bags
___ Foam Vial Packs
___ Other ___

Refrigerant:
2 Gel Ice Pack
___ Loose Ice
___ Other
___ None

Frozen?
(Y) N
Y N
Y N

Received Via:
___ Hand Delivery
___ Federal Express
___ Airborne
___ Other: ___
X Courier
___ UPS
___ Taxi
X Goldstreak

Sample Information:

Samp. #	Bottle #
2	6

Type
Soil
(Water)
Product
Other

Soil VOAs
(Water VOAs)

0 headspace (Y) N N
0 headspace (Y) N N
Preserved? (Y) N
Trip blanks? Y (N)

Condition of Samples:
Containers:
Intact? (Bottle/Lid) (Y) N
Correct Type? (Y) N

CA #

Waters Preserved? (if needed) Y N N

ID's Match C.O.C. (Y) N N

Temperature: 4.9 C ___ CA NO.
(See corrective action on reverse side for explanation if temperature is outside of the MAS recommended range.)

LAB USE ONLY — [illegible] SENT OUT NEEDED BY [illegible]
COC/TAT DOES NOT MATCH WORK — NEED TESTS OVERRIDDEN BY CLIENT

COMMENTS:

USACE

COOLER RECEIPT FORM

Client: URSGWC Accession #: 821867

Project: OU8 LONG-TERM GW SAMPLING

Cooler received on 10/29/99 and opened on 10/29/99

by DELANEY PETERSON Signature Delaney Peterson

1. Were custody seals on outside of cooler and intact? ..... (YES) NO
   a. If YES, how many and where: 2 ON OUTSIDE OF COOLER
   b. Were signature and date correct? ..... (YES) NO
2. Were custody papers taped to lid inside cooler? ..... (YES) NO
3. Were custody papers properly filled out (ink, signed, etc.)? ..... (YES) NO
4. Did you sign custody papers in the appropriate place? ..... (YES) NO
5. Did you attach shipper's packing slip to this form? ..... YES (NO)
6. What kind of packing material was used? BUBBLE BAGS
7. Was sufficient ice used (if appropriate)? Temp 4.9 °C ..... (YES) NO
8. Were all bottles sealed in separate plastic bags? ..... YES (NO)
9. Did all bottles arrive in good condition (unbroken)? ..... (YES) NO
10. Were all bottle labels complete (No., date, signed, pres., etc.)? ..... (YES) NO
11. Did all bottle labels and tags agree with custody papers? ..... (YES) NO
12. Were correct bottles used for the tests indicated? ..... (YES) NO
13. If present, were VOA vials checked for absence of air bubbles and noted if found? ..... (YES) NO
14. Was sufficient amount of sample sent in each bottle? ..... (YES) NO
15. Were correct preservatives used? ..... (YES) NO
16. Corrective action taken, if necessary: ..... YES (NO)
    a. Name of person contacted: _____ Date: _____
    b. See attached MAS CRF for explanation of receipt anomalies Y / N

Continuing Calibration Check
HSL Compounds

Case No: _____ Calibration Date: 11/05/99

Contractor: HRC Renton Time: 16:40

Contract No: _____ Laboratory ID: >00200

Instrument ID: HP14 Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.69499	33.29		
1,1,2-Trichloroethane	.28367	.31295	10.32		
Toluene-d8	.90012	1.02773	6.30		
Toluene	.44393	.46608	4.99	*	
1,2-Dibromoethane	.55271	.67943	22.93		
1,3-Dichloropropane	.74478	.76039	2.10		
Chlorodibromomethane	1.07313	1.23221	14.82		
2-Hexanone	.38909	.32947	15.32		
Tetrachloroethene	.60393	.61109	1.32		
1,1,1,2-Tetrachloroethane	.66316	.72483	9.30		
Chlorobenzene	.94669	.90096	4.83		**
Ethylbenzene	1.49867	1.46246	1.76	*	
Bromoform	.85835	1.03411	20.48		**
(m+p)-Xylene	.47088	.45315	5.20		(Conc=100.00)
Styrene	.78168	.77480	.88		
o-Xylene	.47011	.47543	1.13		
1,1,2,2-Tetrachloroethane	.98230	1.12150	14.17		**
1,2,3-Trichloropropane	.86340	.85921	.48		
Bromofluorobenzene	1.78777	1.68530	5.73		
Isopropylbenzene	1.81687	1.62782	10.41		
Bromobenzene	.79349	.77004	2.95		
n-Propylbenzene	.36423	.33630	7.67		
2-Chlorotoluene	.42945	.39814	7.29		
4-Chlorotoluene	2.03737	1.85124	9.14		
1,3,5-Trimethylbenzene	1.57440	1.43996	8.54		
tert-Butylbenzene	1.23522	1.10043	10.91		
1,2,4-Trimethylbenzene	1.58015	1.41474	10.47		
sec-Butylbenzene	1.67491	1.47528	11.91		
1,3-Dichlorobenzene	1.04339	.98015	6.06		
1,4-Dichlorobenzene	1.10440	1.10311	6.44		
p-Isopropyltoluene	1.33194	1.23045	7.62		
1,2-Dichlorobenzene	1.06003	.98426	7.15		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/05/99

Contractor: HAS Renton Time: 16:48

Contract No: Laboratory ID: >BB200

Instrument ID: HP14 Initial Calibration Date: 10/28/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25056	1.18073	5.47		
1,2-Dibromo-3-Chloropropane	.44443	.46968	5.68		
1,2,4-Trichlorobenzene	.67203	.67253	.05		
Naphthalene	1.20646	1.27347	5.55		
Hexachlorobutadiene	.45554	.46547	2.18		
1,2,3-Trichlorobenzene	.53930	.56301	4.40		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (1) SPCC - System Performance Check Compounds (11)

MultiChem

GC/MS VOLATILES
EPA 8260B

Data Deliverable

ACCESSION: 821867

00001

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 10/28/99 | I.S. + S.S.: 530·34·2 | Instrument I.D.: HP #4

Shift: 1st | I.S.: | SPIKE: | Tune File: BF1025

Analyst: SK | TCLP SPIKE: | GC COLUMN: J & W DB-VRX 75m Capillary Column | Sequence: B1028A

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	05:22	1	MBFB	>B00601		BFB 50ng	LO	5mL	1	+20µl 37691-2/50mL H2O
2		1	MBLNK	62		VSTD001				40µl 550·38·2 /
3		2		63		VSTD002				+20µl " /
4		3		64		VSTD005				+50µl " /
5		4		65		VSTD010				+10µl 530·38·1 /
6		5		66		VSTD020				+20µl " /
7		6		67		VSTD030				+50µl " /
8		7		68		~~VSTD050~~ 2nd Source				+30µl 530·39·1 /
9		8		69		~~VSTD050~~ VSTD100				+100µl 530·39·1 /
10		9		70		~~VSTD150~~ VSTD150				+150µl " /
11	12:34	10		71		VSTD200				+200µl " /
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

10/28/99

* ID File: 5L1060, B1WERM

Cal File: BCH060

Reviewed By: _____

Initial Calibration Data
HSL Compounds

Case No: ---------- Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/20/99

Contract No: ----------

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0069 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC ?
1)	Dichlorodifluoromethane	.91380	.77624	.80632	.84749	.86847	.84283	.89624	.83605	.78813	.84173	5.535	
2)	Chloromethane	.14728	.14585	.15308	.12956	.12519	.12945	.14969	.14205	.13564	.13975	7.220	
3)	Vinyl Chloride	.25895	.21966	.21538	.19082	.18693	.20816	.26060	.26085	.24660	.22716	13.081	*
4)	Bromomethane	.30345	.33240	.30070	.28801	.28615	.27806	.30436	.29900	.27474	.30299	9.307	
5)	Chloroethane	.12833	.11897	.10166	.09962	.10211	.10033	.10478	.10361	.10159	.10677	9.322	
6)	Trichlorofluoromethane	1.01572	.88122	.89304	.93566	.95808	.93587	.99273	.94396	.89443	.93897	4.854	
7)	Acetone	-	-	-	.18850	.18196	.16458	.17819	.16510	.15209	.17174	7.850	
8)	1,1-Dichloroethene	.27503	.22725	.21223	.20853	.20339	.20222	.21573	.21407	.21218	.21896	10.174	*
9)	Methylene Chloride	-	-	.25067	.22359	.22618	.21574	.22304	.22191	.21425	.22506	5.373	
10)	Carbon Disulfide	.56298	.53849	.53067	.52040	.49832	.50596	.53522	.53153	.51996	.52706	3.604	
11)	trans-1,2-Dichloroethene	.30316	.26375	.23933	.23839	.23479	.23426	.24336	.23955	.22820	.24720	9.379	
12)	1,1-Dichloroethane	.50527	.53023	.54148	.54933	.55267	.54659	.55946	.55565	.52690	.54151	3.123	
13)	Vinyl Acetate	-	-	.12628	.13269	.11413	.10883	.22105	-	-	.14060	32.690	2nd
14)	2-Butanone	-	-	-	.13277	.13232	.13071	.14719	.14452	.13965	.13808	4.401	
15)	Chloroform	.80471	.79594	.80520	.83272	.83434	.83009	.85788	.83459	.81157	.82309	2.411	*
16)	cis-1,2-Dichloroethene	.27704	.26795	.25572	.25640	.25768	.25564	.26463	.26025	.25772	.26145	2.262	
17)	Bromochloromethane	.15589	.21045	.19300	.20260	.19793	.20893	.21602	.21235	.20564	.20031	9.060	
18)	2,2-Dichloropropane	.74585	.68127	.70830	.72265	.74814	.74611	.77912	.75448	.73445	.73563	3.869	
19)	Dibromofluoromethane	.70612	.72112	.72941	.74201	.74405	.76569	.78390	.77477	.76452	.74796	3.494	
20)	1,1,1-Trichloroethane	.80815	.75960	.75925	.80819	.82027	.83445	.87061	.84353	.83320	.81525	4.531	
21)	1,2-Dichloroethane-d4	.67243	.75814	.70449	.82519	.83453	.84520	.84649	.80912	.79507	.79785	6.887	
22)	1,2-Dichloroethane	1.25540	1.06994	.90908	.85056	.82087	.83138	.84459	.79239	.78412	.90716	17.230	2nd
23)	1,1-Dichloropropene	.53529	.47557	.47304	.45194	.47142	.47177	.49994	.47524	.47838	.48140	4.904	
24)	Carbon Tetrachloride	.58514	.68928	.74515	.76113	.80630	.84456	.89486	.85853	.85690	.78243	12.688	
25)	Benzene	.68107	.61913	.62988	.59252	.60394	.60728	.62159	.61442	.62044	.62114	4.035	
26)	Dibromomethane	.37879	.41127	.40407	.42324	.44608	.45169	.47424	.45608	.45261	.43321	7.037	
27)	1,2-Dichloropropane	.33155	.30209	.27584	.28140	.27965	.27294	.28654	.28249	.28616	.28874	6.260	*
28)	Trichloroethene	.40574	.39304	.42423	.43191	.43498	.43264	.45784	.43312	.43583	.43437	4.717	
29)	Bromodichloromethane	.84597	.83680	.89742	.92412	.95632	.97872	1.04237	1.01893	.99294	.94373	7.742	
30)	2-Chloroethylvinylether	.11911	.15680	.14420	.16445	.16384	.17496	.18622	.17786	.17135	.16209	12.503	
31)	cis-1,3-Dichloropropene	.42197	.41230	.43313	.45396	.45341	.45465	.50005	.49154	.50410	.45834	7.347	
32)	4-Methyl-2-Pentanone	.26003	.27131	.25648	.30610	.29434	.29675	.32388	.30544	.28954	.28941	7.755	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAS Renton Calibration Date: 10/20/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Laboratory ID: >B0062 >B0063 >B0064 >B0065 >B0066 >B0067 >B0069 >B0070 >B0071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC #
33)	trans-1,3-Dichloropropene	.47762	.47402	.49203	.52166	.52917	.53897	.57632	.54136	.54170	.52143	6.511	
34)	1,1,2-Trichloroethane	.31888	.28317	.26388	.27562	.28246	.27390	.29651	.27997	.27869	.28367	5.561	
35)	Toluene-d8	.93716	.97521	.96910	.96700	.96977	.97466	.99284	.96272	.94716	.96612	1.680	
36)	Toluene	.46892	.45322	.42797	.42728	.42607	.44128	.46590	.44332	.44141	.44393	3.613	*
37)	1,2-Dibromoethane	.52486	.50084	.51760	.54597	.55140	.58128	.61766	.57285	.56192	.55271	6.483	
38)	1,3-Dichloropropane	.93445	.73584	.76570	.75401	.75544	.70930	.69712	.68797	.66242	.74478	10.641	
39)	Chlorodibromomethane	1.08810	1.01900	1.03404	1.10793	1.12522	1.10964	1.09281	1.05238	1.02986	1.07313	3.713	
40)	2-Hexanone	-	-	-	.38871	.40744	.39539	.41270	.38137	.34892	.38909	5.869	
41)	Tetrachloroethene	.81479	.61260	.59958	.58574	.59982	.58212	.57345	.54168	.52560	.60393	13.893	
42)	1,1,1,2-Tetrachloroethane	.73704	.62846	.67312	.70268	.68629	.67233	.64705	.62163	.59981	.66316	6.510	
43)	Chlorobenzene	1.26549	.97402	.95706	.93892	.91425	.90278	.87547	.85200	.83929	.94669	13.524	
44)	Ethylbenzene	1.90802	1.50237	1.49962	1.49165	1.46479	1.44417	1.40578	1.35145	1.33017	1.48867	11.379	*
45)	Bromoform	.82038	.76471	.85120	.91061	.87656	.90067	.90210	.85535	.84355	.85835	5.411	
46)	(m+p)-Xylene	.62413	.48363	.48208	.46220	.47014	.45413	.45128	.43753	.43691	.47080	12.801	
47)	Styrene	.95075	.79019	.75463	.77840	.76731	.76338	.75138	.73868	.74047	.78168	8.390	
48)	o-Xylene	.57362	.47323	.46193	.48637	.46485	.45721	.43923	.44093	.43359	.47011	9.021	
49)	1,1,2,2-Tetrachloroethane	1.16948	.96494	.99543	.99778	.94618	.93342	.93967	.92516	.90860	.98230	7.611	
50)	1,2,3-Trichloropropane	1.03788	.83873	.81130	.82284	.84028	.82557	.82416	.79150	.80912	.83340	9.251	
51)	Bromofluorobenzene	1.84045	1.82174	1.85048	1.80956	1.81165	1.78645	1.74244	1.69168	1.73544	1.78777	2.995	
52)	Isopropylbenzene	2.34253	1.84838	1.76426	1.74623	1.73639	1.72621	1.74084	1.68993	1.73918	1.81687	11.078	
53)	Bromobenzene	.96313	.77588	.74250	.78535	.78175	.77388	.76835	.76067	.78985	.79349	8.216	
54)	n-Propylbenzene	.42640	.33879	.35057	.35132	.35104	.35939	.36427	.36233	.37399	.36423	6.974	
55)	2-Chlorotoluene	.52242	.41317	.42271	.42620	.41796	.40883	.41402	.41412	.42560	.42945	8.236	
56)	4-Chlorotoluene	2.47075	2.20282	2.03070	1.97065	1.93200	1.91640	1.94898	1.91250	1.95141	2.03737	9.120	
57)	1,3,5-Trimethylbenzene	2.03361	1.51245	1.49781	1.54050	1.53261	1.51705	1.53197	1.48374	1.52055	1.57448	10.994	
58)	tert-Butylbenzene	1.68414	1.22543	1.17455	1.21057	1.17063	1.16041	1.17691	1.13997	1.17441	1.23522	13.782	
59)	1,2,4-Trimethylbenzene	2.07715	1.60026	1.48389	1.53951	1.52970	1.49443	1.52667	1.47152	1.49824	1.58015	12.041	
60)	sec-Butylbenzene	2.26798	1.71232	1.57678	1.58327	1.57174	1.56701	1.61405	1.56090	1.61840	1.67401	13.570	
61)	1,3-Dichlorobenzene	-	1.12975	1.04084	1.07739	1.01587	.99316	1.03755	1.01138	1.04116	1.04339	4.125	
62)	1,4-Dichlorobenzene	-	1.27523	1.21368	1.22362	1.13783	1.14591	1.17903	1.13998	1.15991	1.18440	4.148	
63)	p-Isopropyltoluene	-	1.46527	1.29800	1.32744	1.31433	1.31212	1.33044	1.29223	1.31773	1.33194	4.168	
64)	1,2-Dichlorobenzene	-	1.14744	1.06340	1.10174	1.03593	1.03044	1.03839	1.01899	1.04389	1.06803	4.106	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No:

Instrument ID: HP#4

Contractor: MAS Renton

Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30

Maximum % RSD for CCC is 30%

Laboratory ID: >B0062 >B0063 >B0064 >B0065 >B0066 >B0067 >B0069 >B0070 >B0071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC ?
65)	n-Butylbenzene	1.98590	1.27720	1.20574	1.17542	1.11271	1.14925	1.16310	1.10435	1.13533	1.25656	22.161	2nd
66)	1,2-Dibromo-3-Chloropropane	-	.47706	.42397	.45208	.43355	.44760	.45420	.43030	.43583	.44443	3.851	
67)	1,2,4-Trichlorobenzene	-	.78506	.68776	.68796	.64122	.66901	.64694	.63031	.63441	.67283	7.540	
68)	Naphthalene	-	-	1.32413	1.27465	1.17163	1.20022	1.15645	1.15314	1.15701	1.20646	5.612	
69)	Hexachlorobutadiene	-	.53965	.49333	.47758	.44755	.45985	.42405	.39971	.40263	.45554	10.488	
70)	1,2,3-Trichlorobenzene	-	.66009	.55503	.55613	.51296	.52844	.50760	.49319	.49298	.53930	10.676	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
1)	Dichlorodifluoromethane	.998271	.999590	-1.34	1.45		
2)	Chloromethane	.998740	.999191	.124	1.71		**
3)	Vinyl Chloride	.998447	.998510	2.24	2.79	*	
4)	Bromomethane	.998283	.999044	-.715	1.45		
5)	Chloroethane	.999062	.999913	-.139	.405		
6)	Trichlorofluoromethane	.998812	.999682	-.956	1.29		
7)	Acetone	.996286	.999011	-4.81	4.06		
8)	1,1-Dichloroethene	.999889	.999890	.313	.375	*	
9)	Methylene Chloride	.999668	.999831	-.956	.569		
10)	Carbon Disulfide	.999825	.999862	.156	.616		
11)	trans-1,2-Dichloroethene	.999412	.999769	-.695	.765		
12)	1,1-Dichloroethane	.999381	.999768	-.642	.865		**
13)	Vinyl Acetate	.967842	.999652	10.11	-3.49		
14)	2-Butanone	.999358	.999745	.419	3.29		
15)	Chloroform	.999672	.999821	-.487	.703	*	
16)	cis-1,2-Dichloroethene	.999925	.999958	-.0825	.348		
17)	Bromochloromethane	.999668	.999880	-.0290	1.05		
18)	2,2-Dichloropropane	.999634	.999892	-.310	.887		
19)	Dibromofluoromethane	-	-	-	-		
20)	1,1,1-Trichloroethane	.999806	.999918	.0164	.795		
21)	1,2-Dichloroethane-d4	-	-	-	-		
22)	1,2-Dichloroethane	.999502	.999844	-1.45	-.00380		
23)	1,1-Dichloropropene	.999756	.999803	-.0111	.492		
24)	Carbon Tetrachloride	.999773	.999849	.523	1.14		
25)	Benzene	.999971	.999977	.243	.0629		
26)	Dibromomethane	.999777	.999889	.117	.887		
27)	1,2-Dichloropropane	.999923	.999945	.352	.00575	*	
28)	Trichloroethene	.999716	.999786	-.142	.481		
29)	Bromodichloromethane	.999690	.999839	.322	1.21		
30)	2-Chloroethylvinylether	.999229	.999745	.0121	1.65		
31)	cis-1,3-Dichloropropene	.999731	.999841	1.39	.636		
32)	4-Methyl-2-Pentanone	.998628	.999523	-.529	1.79		
33)	trans-1,3-Dichloropropene	.999582	.999730	.0238	.906		
34)	1,1,2-Trichloroethane	.999598	.999734	-.199	.670		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No:

Instrument ID: HP#4

Contractor: MAS Renton

Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
35)	Toluene-d8	-	-	-	-		
36)	Toluene	.999700	.999821	-.0826	.729	*	
37)	1,2-Dibromoethane	.999118	.999676	-.373	1.34		
38)	1,3-Dichloropropane	.999611	.999951	-1.58	-.103		
39)	Chlorodibromomethane	.999588	.999908	-1.19	.340		
40)	2-Hexanone	.995596	.999270	-4.77	5.12		
41)	Tetrachloroethene	.999204	.999957	-1.97	.191		
42)	1,1,1,2-Tetrachloroethane	.999264	.999998	-1.97	.162		
43)	Chlorobenzene	.999707	.999992	-1.45	-.323		**
44)	Ethylbenzene	.999658	.999979	-1.58	-.172	*	
45)	Bromoform	.999538	.999920	-.956	.512		**
46)	(m+p)-Xylene	.999892	.999964	-1.98	-.654		
47)	Styrene	.999962	.999980	-.586	-.260		
48)	o-Xylene	.999909	.999968	-.981	-.379		
49)	1,1,2,2-Tetrachloroethane	.999626	.999057	.311	-.840		**
50)	1,2,3-Trichloropropane	.999839	.999841	-.691	-.592		
51)	Bromofluorobenzene	-	-	-	-		
52)	Isopropylbenzene	.999894	.999903	-.124	-.351		
53)	Bromobenzene	.999750	.999891	.302	-.509		
54)	n-Propylbenzene	.999811	.999951	.735	-.135		
55)	2-Chlorotoluene	.999832	.999971	.398	-.493		
56)	4-Chlorotoluene	.999923	.999946	-.0349	-.396		
57)	1,3,5-Trimethylbenzene	.999873	.999879	-.160	-.336		
58)	tert-Butylbenzene	.999835	.999861	-.122	-.507		
59)	1,2,4-Trimethylbenzene	.999883	.999883	-.323	-.276		
60)	sec-Butylbenzene	.999761	.999827	.229	-.374		
61)	1,3-Dichlorobenzene	.999802	.999873	.323	-.446		
62)	1,4-Dichlorobenzene	.999882	.999882	-.191	-.257		
63)	p-Isopropyltoluene	.999900	.999902	-.107	-.238		
64)	1,2-Dichlorobenzene	.999887	.999924	.0668	-.627		
65)	n-Butylbenzene	.999752	.999752	-.488	-.456		
66)	1,2-Dibromo-3-Chloropropane	.999731	.999796	-.572	.152		
67)	1,2,4-Trichlorobenzene	.999890	.999921	-1.00	-.485		
68)	Naphthalene	.999951	.999951	-1.03	-.982		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No:

Instrument ID: HP#4

Contractor: MAS Renton

Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30

Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
69)	Hexachlorobutadiene	.999360	.999650	-2.71	-1.05		
70)	1,2,3-Trichlorobenzene	.999851	.999935	-1.51	-.639		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

00008

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/5/99 | I.S. + S.S.: 530-41-2 | Instrument I.D.: HP #4

Shift: 2nd | I.S.: | Tune File: BF1025

Analyst: AM/SK | SPIKE: 530-42-1 | Sequence: B1105B

TCLP SPIKE:

GC COLUMN: J&W DB-VRX 75m Capillary Column

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	1557	1	MPFB	7B0207		BFB 50ng	W	5ml	1	+20ul 530-42-2 / 50ml H2O
2		1	MB260C	08		VSTD050 5ng 11/5/99				+50ul ~~530-40-1~~ / 50ml H2O 530-39-2 AM 11/5/99
3		1		09		VBLK1105BA				
4		2		10		MBBS ABS				+20ul 530-42-1 / 50ml H2O
5		3		11	<2	821867-1 99PRDA-106-GW				
6		4		12		-2 -107-GW				
7		5		13		910057-9 TB				
8		6		14		911017-5 TB				
9		7		15		821875-1 99PRDA-108-GW				
10		8		16		-2 -109-GW				
11		10		17		-3 -110-GW				
12		11		18		-4 -111-GW				
13		12		19		-5 -112-GW				Reqd 10x for TCE
14		13		20		-6 -113-GW				
15		14		21		-7 -114-GW				
16	03:27	15		22		821867-1MS -106-GW				+17ml 530-42-1 spiked into VOA vial
17	04:12	15		23		-1MSD				
18		16		24		911001-1 FRIDGE VOA				
19	05:43	17		25		-2 VOA				
20										
21										
22										
23						11/10/99				
24										

ID File: B14060

Cal File: BC4060

Reviewed By:

Continuing Calibration Check
HSL Compounds

Case No: | Calibration Date: 11/05/99

Contractor: HSC Renton | Time: 16:48

Contract No: | Laboratory ID: >B0280

Instrument ID: HP#4 | Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Chloromethane = 0.10

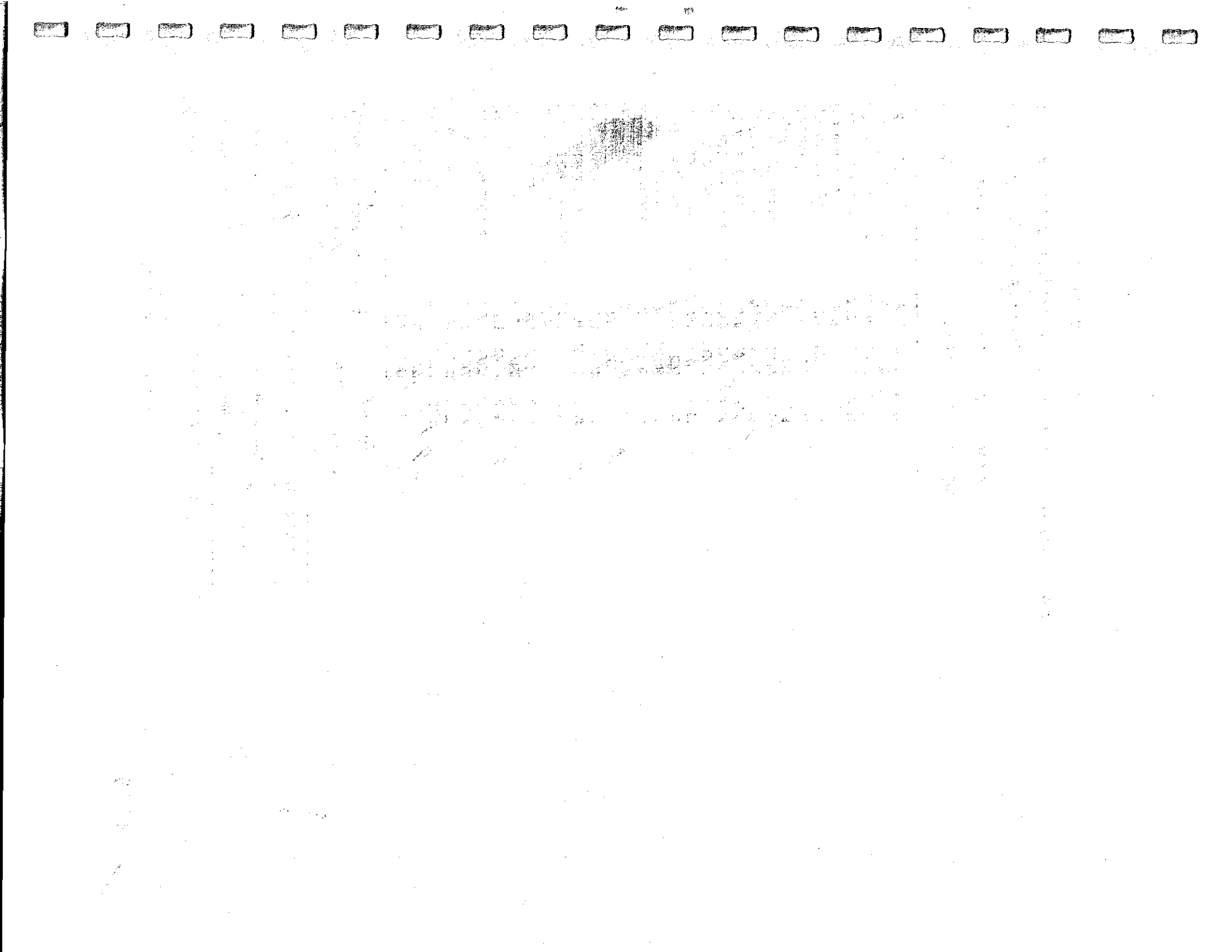
Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.84173	.84943	.91		
Chloromethane	.13075	.11577	17.16		**
Vinyl Chloride	.22746	.24272	6.71	*	
Bromomethane	.30299	.26733	11.77		
Chloroethane	.10677	.10948	2.54		
Trichlorofluoromethane	.93897	1.18362	26.06		
Acetone	.17174	.09533	44.49		
1,1-Dichloroethene	.21896	.19352	11.62	*	
Methylene Chloride	.22506	.19993	11.16		
Carbon Disulfide	.52706	.46088	12.72		
trans-1,2-Dichloroethene	.24720	.22068	10.73		
1,1-Dichloroethane	.54151	.50019	7.63		**
Vinyl Acetate	.14060	.48019	312.06		
2-Butanone	.13886	.11653	16.08		
Chloroform	.82309	.81918	.48	*	
cis-1,2-Dichloroethene	.26145	.23646	9.56		
Bromochloromethane	.20031	.20004	.14		
2,2-Dichloropropane	.73563	.73570	.01		
Dibromofluoromethane	.74796	.70959	5.57		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.85064	4.34		
1,2-Dichloroethane-d4	.79785	.91543	14.74		
1,2-Dichloroethane	.90716	.80600	5.87		
1,1-Dichloropropene	.48140	.49670	3.18		
Carbon Tetrachloride	.78243	.96371	23.17		
Benzene	.62114	.58297	6.15		
Dibromomethane	.43321	.49549	14.38		
1,2-Dichloropropane	.28874	.26348	8.78	*	
Trichloroethene	.43437	.43042	.91		
Bromodichloromethane	.94373	1.09710	16.26		
2-Chloroethylvinylether	.16209	.13444	17.06		
cis-1,3-Dichloropropene	.45034	.58942	20.08		
4-Methyl-2-Pentanone	.28941	.32617	10.63		

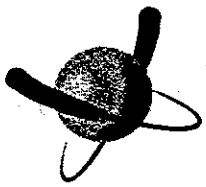
RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)





MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821875
UST - 026

November 18, 1999

URS Greiner/Woodward-Clyde
3501 Denali Street
Suite 101
Anchorage AK 99503

Attention : Scott Kendall

Project Number : 74F0E9408U/05700

Project Name : OUB Long Term GW Sampling

Dear Mr. Kendall:

On November 3, 1999, MultiChem Analytical Services received seven samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Sincerely,

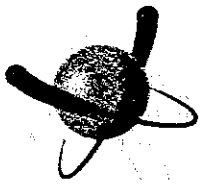
Gary A. Morelli

Gary A. Morelli
Project Manager

GAM/hal/trm

Enclosure

560 Naches Avenue SW, Suite 101, Renton, Washington 98055-2200 • 425-228-8335 • FAX 425-228-8336 • 1-800-609-0580 • info@multichem.com



MultiChem
ANALYTICAL SERVICES

November 23, 1999

MAS I.D. # 821875

URS Greiner/Woodward Clyde
3501 Denali Street
Suite 101
Anchorage, AK 99503

Attn: Scott Kendall

Project Name: OUB Long-Term GW Sampling

Project Number: 74-FOE9408U/05700

Dear Mr. Kendall:

On November 1, 1999, MultiChem Analytical Services of Alaska received seven samples for analysis in conjunction with the above listed project. The requested analyses were performed using EPA or equivalent methods. The reports of analyses and ACOE deliverables and COELT 1.2a EDD are enclosed. Below is an outline of the laboratories that participated in this project.

MAS-WA Analysis Performed: GC Volatiles (8260B)

Please do not hesitate to contact us at (907) 248-8273, if you have any questions or comments.

Sincerely,
MultiChem Analytical Services, LLC

Victoria L. Bayly
Project Manager

2000 West International Airport Road, Suite C7, Anchorage, Alaska 99502-1116 • 907-248-8273 • FAX 907-248-8274

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

SAMPLE CROSS REFERENCE SHEET

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG TERM GW SAMPLING

MAS #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
821875-1	99PRDA-108-GW	10/28/99	WATER
821875-2	99PRDA-109-GW	10/28/99	WATER
821875-3	99PRDA-110-GW	10/29/99	WATER
821875-4	99PRDA-111-GW	10/29/99	WATER
821875-5	99PRDA-112-GW	11/01/99	WATER
821875-6	99PRDA-113-GW	11/01/99	WATER
821875-7	99PRDA-114-GW	11/01/99	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	7

MAS STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

ANALYTICAL SCHEDULE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG TERM GW SAMPLING

ANALYSIS	TECHNIQUE	REFERENCE	LAB
VOLATILE ORGANICS ANALYSIS	GCMS	EPA 8260B	R

R = MAS - Renton
ANC = MAS - Anchorage
SUB = Subcontract

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG TERM GW SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The target compound hexachlorobutadiene was detected in the method blank analyzed on November 5, 1999, at a level above the reporting limit. Since reportable concentrations of hexachlorobutadiene were not detected above the reporting limit in any of the associated samples, no further corrective action was performed.

The matrix spike duplicate (MSD) associated with the samples in this accession was analyzed 15 minutes outside of the 12 hour analysis window. Since the matrix spike (MS) and unspiked sample were analyzed within the analysis window, and all associated MS/MSD recoveries as well as all relative percent difference (RPD) criteria were within MultiChem's established control limits, no further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	3.3
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	109	50 - 150
1,2-DICHLOROETHANE-D4	115	81 - 130
TOLUENE-D8	105	80 - 120
BROMOFLUOROBENZENE	98	75 - 118

MAS I.D. # 821875-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/28/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-108-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/28/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-108-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	110	50 - 150
1,2-DICHLOROETHANE-D4	124	81 - 130
TOLUENE-D8	100	80 - 120
BROMOFLUOROBENZENE	106	75 - 118

MAS I.D. # 821875-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/28/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-109-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/28/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-109-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	1.7
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	111	50 - 150
1,2-DICHLOROETHANE-D4	125	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	101	75 - 118

MAS I.D. # 821875-3

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/29/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-110-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	12
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-3

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/29/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-110-GW	DATE ANALYZED	: 11/05/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	130
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	110	50 - 150
1,2-DICHLOROETHANE-D4	126	81 - 130
TOLUENE-D8	99	80 - 120
BROMOFLUOROBENZENE	105	75 - 118

MAS I.D. # 821875-4

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/29/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-111-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	20
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-4

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 10/29/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-111-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	13
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	112	50 - 150
1,2-DICHLOROETHANE-D4	127	81 - 130
TOLUENE-D8	95	80 - 120
BROMOFLUOROBENZENE	103	75 - 118

MAS I.D. # 821875-5

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-112-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	<1.0	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	<1.0	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	9.3	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	3.8	
CIS-1,2-DICHLOROETHENE	40	
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	3.4	0.0034
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	870	D4
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	4.6	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	6.6	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D4 = Value from a 10 fold diluted analysis.

MAS I.D. # 821875-5

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-112-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	13
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	111	50 - 150
1,2-DICHLOROETHANE-D4	127	81 - 130
TOLUENE-D8	98	80 - 120
BROMOFLUOROBENZENE	102	75 - 118

MAS I.D. # 821875-6

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-113-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	4.1
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	1.2 0.0012
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	34
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-6

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-113-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	47
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	111	50 - 150
1,2-DICHLOROETHANE-D4	127	81 - 130
TOLUENE-D8	97	80 - 120
BROMOFLUOROBENZENE	104	75 - 118

MAS I.D. # 821875-7

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-114-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	3.4
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	79
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875-7

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/01/99
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: 11/03/99
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-114-GW	DATE ANALYZED	: 11/06/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	36
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	116	50 - 150
1,2-DICHLOROETHANE-D4	127	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	101	75 - 118

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/08/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/08/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	110	50 - 150
1,2-DICHLOROETHANE-D4	97	81 - 130
TOLUENE-D8	100	80 - 120
BROMOFLUOROBENZENE	99	75 - 118

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG TERM GW SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/05/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	43.0	86	N/A	N/A	N/A
BENZENE	<1.00	50.0	44.9	90	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	50.0	100	N/A	N/A	N/A
TOLUENE	<1.00	50.0	50.6	101	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	49.5	99	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	106	N/A	50 - 150
1,2-DICHLOROETHANE-D4	114	N/A	81 - 130
TOLUENE-D8	102	N/A	80 - 120
BROMOFLUOROBENZENE	98	N/A	75 - 118

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT	: URS GREINER/WOODWARD-CLYDE	SAMPLE I.D. #	: BLANK
PROJECT #	: 74F0E9408U/05700	DATE EXTRACTED	: N/A
PROJECT NAME	: OUB LONG TERM GW SAMPLING	DATE ANALYZED	: 11/08/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B		

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	52.9	106	N/A	N/A	N/A
BENZENE	<1.00	50.0	50.6	101	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	46.4	93	N/A	N/A	N/A
TOLUENE	<1.00	50.0	50.4	101	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	50.8	102	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	113	N/A	50 - 150
1,2-DICHLOROETHANE-D4	100	N/A	81 - 130
TOLUENE-D8	102	N/A	80 - 120
BROMOFLUOROBENZENE	96	N/A	75 - 118

MAS I.D. # 821875

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U/05700
PROJECT NAME : OUB LONG TERM GW SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : 821867-1
DATE EXTRACTED : N/A
DATE ANALYZED : 11/05/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	44.6	89	44.5	89	0
BENZENE	<1.00	50.0	47.3	95	46.2	92	2
TRICHLOROETHENE	<1.00	50.0	51.8	104	51.7	103	0
TOLUENE	<1.00	50.0	47.3	95	47.1	94	0
CHLOROBENZENE	<1.00	50.0	47.3	95	45.2	90	5

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	72 - 137	20
BENZENE	80 - 133	20
TRICHLOROETHENE	79 - 120	20
TOLUENE	72 - 137	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	110	112	50 - 150
1,2-DICHLOROETHANE-D4	130	127	81 - 130
TOLUENE-D8	97	98	80 - 120
BROMOFLUOROBENZENE	105	106	75 - 118

Due 11/20/99

MultiChem Analytical Services

To Renton

2000 W. INTL. AIRPORT RD., # C-7
ANCHORAGE, AK 99502
Phone: (907)248-8273 Fax: (907)248-8274

ACCESSION #: 821875

CHAIN OF CUSTODY

Page: 1 of

COMPANY: URS Greiner Woodward Clyde
ADDRESS: 3501 Denali St., Suite 101
Anchorage, AK 99503
PHONE: (907) 561-1020 FAX: (907) 563-3198
REPORT TO: Scott Kendall
PROJECT NAME: OUB Long Term GW Sampling
PROJECT #: 741F0E9408H / 05700
MAS WILL: (DISPOSE) / RETURN samples (circle one)

SAMPLE ID	DATE	TIME	MATRIX	LAB #
99PRDA-108-GW	10-28-99	1513	Water	01
99PRDA-109-GW	10-28-99	1710	Water	02
99PRDA-110-GW	10-29-99	1120	Water	03
99PRDA-111-GW	10-29-99	1600	Water	04
99PRDA-112-GW	11-01-99	1040	Water	05
99PRDA-113-GW	11-01-99	1230	Water	06
99PRDA-114-GW	11-01-99	1355	Water	07
Small amt. of headspace in 1 of 3 vials - APA				

MAS-Alaska Analyses													MAS-WA or Subcontract Analyses																				
GRO by 8015M	BTEX by 8021M	GRO&BTEX/8015M/8021M	DRO by 8100M	DRO-EXTENDED by 8100M	GRO by AK101	GRO/BTEX by AK101/8021	DRO by AK102	RRO by AK103	DRO/RRO by AK102/103	Flashpoint/Ignitability	pH	TRPH by 418.1	8260-GC/MS Volatiles	8270-GC/MS Semivolatiles	8081/8082-Pesticides&PCB	PCBs only by 8082	8021-Arom/Halog Volatiles	Total Metals: As,Cd,Cr,Pb	TCLP-RCRA 8 Metals/1311	RCRA 8 Metals	Metals (list below) *	TOC										Total # of Containers
													1																				3
													1																				3
													1																				3
													1																				3
													1																				3
													1																				3
													1																				3

Turnaround time (TAT):	Report type :	Sample Receipt:
STANDARD: ☒ (Winter: 5 WD FAX FUELS, 10 WD OTHER)	STANDARD (Level II) ☐	TOTAL # CONTAINERS: 21
RUSH (check one):	or with Raw Data Pkg.:	RECEIVED:
24 HR ☐ 48 HR ☐	ADEC ☐ ACOE ☒ CHRO's ☐	COOLER SEALS PRESENT? (N/A) Y N
72 HR ☐ 1 WK ☐	Electronic Data Disc (EDD) ☒	IF SO, INTACT? (N/A) Y N
PURCHASE ORDER #:		COOLER TEMP: 3.0°C
		CONTAINERS REC'D INTACT? (Y) N
		RECEIVED VIA: Hand carry

Relinquished by:	Relinquished by:
Signature: Cynthia Ann Tomlinson Date: Nov. 1, 1999	Signature: Date: 11/2/99
Printed name: Cynthia Tomlinson Time: 1645	Printed name: V BRADLEY Time: 1025A
Company:	Company: MAS-Pkg
Received by:	Received at Laboratory by:
Signature: Date: 11/1/99	Signature: Date: 11/3/99
Printed name: Lorraine Andela Time: 1645	Printed name: DELANEY PETERSON Time: 1140
Company: MultiChem AK	Company: MASR

SPECIAL INSTRUCTIONS:

* Metals needed (see above):

NON-CONFORMANCES?
(Y) N ( )
(if Y see other side)

MultiChem Analytical Services
SAMPLE LOG-IN CHECKLIST

DATE: 11/3/99
TIME: 1140
INITIALS: LD

ACCESSION NO. 821875
CLIENT: URSGWK
PROJECT: OU3 Long Term GW Sampling

Shipping:
Type:
X Cooler
___ Box
___ Other

COC Seals:
X Ship. Cont.
___ On Bottles
___ None

Intact?
(Y) N
Y N

Packing Material:
___ Styrofoam
X Bubble Bags
___ Foam Vial Packs
___ Other___

Refrigerant:
X Gel Ice Pack
___ Loose Ice
___ Other
___ None

Frozen?
(Y) N
Y N
Y N

Received Via:
___ Hand Delivery
___ Federal Express
___ Airborne
___ Other:___
X Courier
___ UPS
___ Taxi
X Goldstreak

Sample Information:

Samp. #	Bottle #
7	21

Type
Soil
(Water)
Product
Other

Soil VOAs
(Water VOAs)

0 headspace Y N N ___
0 headspace Y (N) N 1
Preserved? (Y) N ___
Trip blanks? (Y) (N) ___

Condition of Samples:
Containers:
Intact? (Bottle/Lid) (Y) N
Correct Type? (Y) N

CA # ___
CA # ___

Waters Preserved? (if needed) Y N N ___

ID's Match C.O.C. (Y) N N ___

Temperature: 3.8 C ___ CA NO.
(See corrective action on reverse side for explanation if temperature is outside of the MAS recommended range.)

LAB USE ONLY

COMMENTS:

MultiChem Analytical Services, LLC — **Anchorage, AK**

SAMPLE LOG-IN CHECKLIST

ACCESSION #: 82575 — SUBCONTRACT WORK? YES / NO

CLIENT NAME: URSG/WCC — TO LAB (circle): ~~MAS-R~~ / OTHER: _____

LOGGED-IN BY (print): Lorraine — (sign): L Pindell

Date received: 11/1/99 @ 1625 — Client's Cooler # (if any): _____

Is the project for: ACOE? YES / NO NAVY? YES / NO

1.	Did cooler arrive with shipping document? (Hand delivery) N/A	YES		NO
2.	Are Custody seals present on cooler? YES (NO) How many? — Where? —			
	Seal date: — Seal name: — Intact?	(N/A)	YES	NO
3.	Are Custody seals present on sample containers?		YES	NO
	If "YES", intact?	(N/A)	YES	NO
4.	Is the Chain of Custody (C-O-C) sealed in plastic bag? YES / NO Taped to cooler lid?		YES	NO
5.	Is the C-O-C complete? * Relinquished by client: (YES) / NO Analyses marked off:		(YES)	NO
	* C-O-C or other representative documents, letters, and/or shipping memos. Signed/received by lab:		(YES)	NO
6.	Is the C-O-C in agreement with samples received?			
	Sample ID's: YES / NO Matrix: Water		(YES)	NO
	Date sampled: YES / NO # Containers: 21		(YES)	NO
7.	Has the main logbook been filled out properly?		(YES)	NO
8.	If samples are RUSH has notice been given?	(N/A)	YES	NO
9.	Is proper preservation indicated on label(s)?	N/A	(YES)	NO
10	Did pH check verify preservative indicated? (Volatiles)	(N/A)	YES	NO
11	Is there sufficient sample volume for analyses?		(YES)	NO
12	Are samples in proper containers? (see reference chart)		(YES)	NO
13	Are all samples within holding times for requested analysis?		(YES)	NO
14	Are all sample containers intact? (i.e. not broken, leaking...)		(YES)	NO
15	Are samples individually bagged ?		YES	(NO)
16	Are all volatile samples headspace-free (<pea-size for waters)?	N/A	YES	(NO)
17	Shipping container (circle one): (Cooler) / Box / Other:			
18	Type of packing material used (circle one): (Bubble Wrap) / Styrofoam Peanuts / Vermiculite / None			
19	Refrigerant (circle one): (Gel Ice) Loose Ice / Other: / None			
20	Was refrigerant frozen upon receipt?		(YES)	NO
21	Cooler temperature(s): #1: 3.0 °C #2: — °C			

Sample tagging check for QC:

Sample ID's issued in order of appearance on C-O-C:	(YES)	NO
Tags placed in appropriate areas of sample containers:	(YES)	NO

Initials of reviewer: [signature]

Describe any "NO" items from checklist above:

#16 - small amt. of headspace in 1 of 3 vials Sample #4, TPH (insignificant)

Was client contacted: YES / NO / N/A Date: _____ Name of person contacted: _____

Describe client instructions or actions taken: _____

USACE
COOLER RECEIPT FORM

Client: URSGWC Accession #: 821875

Project: OUB LONG TERM GW SAMPLING

Cooler received on 11/3/99 and opened on 11/5/99

by DELANEY PETERSON Signature Delaney Peterson

1. Were custody seals on outside of cooler and intact?	(YES)	NO
a. If YES, how many and where: 2 on outside		
b. Were signature and date correct?	(YES)	NO
2. Were custody papers taped to lid inside cooler?	(YES)	NO
3. Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO
4. Did you sign custody papers in the appropriate place?	(YES)	NO
5. Did you attach shipper's packing slip to this form?	YES	(NO)
6. What kind of packing material was used? BUBBLE BAGS		
7. Was sufficient ice used (if appropriate)? Temp 5.8 °C	(YES)	NO
8. Were all bottles sealed in separate plastic bags?	YES	(NO)
9. Did all bottles arrive in good condition (unbroken)?	(YES)	NO
10. Were all bottle labels complete (No., date, signed, pres., etc.)?	(YES)	NO
11. Did all bottle labels and tags agree with custody papers?	(YES)	NO
12. Were correct bottles used for the tests indicated?	(YES)	NO
13. If present, were VOA vials checked for absence of air bubbles and noted if found?	(YES)	NO
14. Was sufficient amount of sample sent in each bottle?	(YES)	NO
15. Were correct preservatives used?	(YES)	NO
16. Corrective action taken, if necessary:	YES	(NO)
a. Name of person contacted _____ Date _____		
b. See attached MAS CRF for explanation of receipt anomalies Y N		

MultiChem

GC/MS VOLATILES
EPA 8260B

Data Deliverable

ACCESSION: 821875

MultiChem Analytical Services - Renton, WA

00001

GC/MS Volatile Organic Analysis Benchsheet

Date: 10/28/99 | I.S. + S.S.: 530·34·2 | Instrument I.D.: HP #4

Shift: 1st | I.S.: | SPIKE: | Tune File: BF1025

Analyst: SK | TCLP SPIKE: | GC COLUMN: J & W DB-VRX 75m Capillary Column | Sequence: B102817

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	05:22	1	MBFB	>B00601		BFB 50ng	LD	5ml	1	+20µl 376912/50ml H2O
2		1	MBLow	62		VSTD001				+10µl 530·38 2 /
3		2		63		VSTD002				+20µl /
4		3		64		VSTD005				+50µl /
5		4		65		VSTD010				+10µl 530·38·1 /
6		5		66		VSTD020				+20µl /
7		6		67		VSTD050				+50µl /
8		7		68		~~VSTD100~~ 2nd Source				+~~50~~µl 530·39·1 /
9		8		69		~~VSTD150~~ VSTD100				+100µl 530·39·1 /
10		9		70		# VSTD150				+150µl /
11	12:34	10		71		VSTD200				+200µl /
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

SK 10/28/99

* ID File: ST10600, BIWERM

Cal File: BC10600

Reviewed By:

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/20/89

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0069 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC	S
1)	Dichlorodifluoromethane	.91390	.77624	.80632	.84749	.86847	.84283	.89624	.83605	.78813	.84173	5.535		
2)	Chloromethane	.14720	.14505	.15308	.12950	.12519	.12945	.14909	.14205	.13564	.13975	7.220		
3)	Vinyl Chloride	.25895	.21966	.21538	.19082	.19693	.20818	.26060	.26005	.24660	.22746	13.081	*	
4)	Bromomethane	.30345	.33240	.30070	.28801	.28615	.27806	.30436	.29900	.27474	.30299	9.387		
5)	Chloroethane	.12833	.11887	.10166	.09962	.10211	.10033	.10478	.10361	.10159	.10677	9.322		
6)	Trichlorofluoromethane	1.01572	.88122	.89304	.93506	.95008	.93507	.99273	.94396	.89443	.93697	4.054		
7)	Acetone	-	-	-	.18850	.18106	.16458	.17819	.16510	.15209	.17174	7.850		
8)	1,1-Dichloroethene	.27503	.22725	.21223	.20053	.20339	.20222	.21573	.21407	.21218	.21896	10.174	*	
9)	Methylene Chloride	-	-	.25067	.22359	.22618	.21574	.22304	.22191	.21425	.22506	5.373		
10)	Carbon Disulfide	.56200	.53849	.53067	.52040	.49032	.50596	.53522	.53153	.51996	.52700	3.604		
11)	trans-1,2-Dichloroethene	.30316	.26375	.23938	.23839	.23479	.23426	.24336	.23955	.22820	.24720	9.379		
12)	1,1-Dichloroethane	.50527	.53623	.54140	.54933	.55207	.54059	.55946	.55565	.52690	.54151	3.123		
13)	Vinyl Acetate	-	-	.12628	.13269	.11413	.10883	.22105	-	-	.14080	32.690	2nd	
14)	2-Butanone	-	-	-	.13277	.13232	.13071	.14719	.14452	.13965	.13800	4.401		
15)	Chloroform	.80471	.79594	.80520	.83272	.83434	.83089	.85708	.83459	.81157	.82309	2.411	*	
16)	cis-1,2-Dichloroethene	.27704	.26795	.25572	.25640	.25708	.25504	.26403	.26025	.25772	.26145	2.762		
17)	Bromochloromethane	.15589	.21045	.19300	.20260	.19793	.20893	.21602	.21235	.20564	.20031	9.060		
18)	2,2-Dichloropropane	.74585	.68127	.70838	.72205	.74814	.74611	.77812	.75440	.73445	.73503	3.869		
19)	Dibromofluoromethane	.70612	.72112	.72941	.74201	.74405	.76589	.78390	.77477	.76452	.74796	3.494		
20)	1,1,1-Trichloroethane	.80815	.75960	.75925	.80819	.82027	.83445	.87061	.84353	.83320	.81525	4.531		
21)	1,2-Dichloroethane-d4	.67243	.75814	.79449	.82519	.83453	.84528	.84649	.80912	.79507	.79785	6.887		
22)	1,2-Dichloroethane	1.25540	1.06994	.90900	.85056	.82087	.83138	.84459	.79239	.78412	.90710	17.230	2nd	
23)	1,1-Dichloropropene	.53529	.47557	.47304	.45194	.47142	.47177	.49994	.47524	.47838	.48140	4.904		
24)	Carbon Tetrachloride	.58514	.68928	.74515	.76113	.80830	.84456	.88486	.85853	.85090	.78243	12.088		
25)	Benzene	.68107	.61913	.62988	.59252	.60394	.60728	.62159	.61442	.62044	.62114	4.035		
26)	Dibromomethane	.37879	.41127	.40407	.42324	.44608	.45168	.47424	.45088	.45201	.43321	7.087		
27)	1,2-Dichloropropane	.33155	.30209	.27584	.28140	.27965	.27204	.28654	.28249	.28618	.28874	6.260	*	
28)	Trichloroethene	.40574	.39304	.42423	.43191	.43498	.43264	.45784	.43312	.43583	.43437	4.717		
29)	Bromodichloromethane	.84597	.83680	.89742	.92412	.95632	.97872	1.04237	1.01893	.99294	.94373	7.742		
30)	2-Chloroethylvinylether	.11911	.15088	.14420	.16445	.16304	.17496	.18622	.17786	.17135	.16209	12.503		
31)	cis-1,3-Dichloropropene	.42197	.41230	.43313	.45396	.45341	.45465	.50005	.49154	.50410	.45834	7.347		
32)	4-Methyl-2-Pentanone	.20883	.27131	.25648	.30610	.29434	.29075	.32388	.30544	.28954	.28941	7.755		

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

00003

Case No: ----------

Instrument ID: HP14

Contractor: MAS Renton

Calibration Date: 10/20/99

Contract No: ----------

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0069 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC *
33)	trans-1,3-Dichloropropene	.47262	.47402	.49203	.52166	.52917	.53897	.57632	.54136	.54170	.52143	8.511	
34)	1,1,2-Trichloroethane	.31800	.28317	.26300	.27502	.28246	.27390	.29051	.27997	.27009	.28307	5.561	
35)	Toluene-d8	.93716	.97521	.96910	.96700	.96977	.97466	.99284	.96217	.94716	.96612	1.680	
36)	Toluene	.46092	.45322	.42792	.42720	.42607	.44120	.46590	.44332	.44141	.44393	3.613	*
37)	1,2-Dibromoethane	.52486	.50084	.51760	.54597	.55140	.58128	.61766	.57285	.56192	.55271	6.483	
38)	1,3-Dichloropropane	.93445	.73584	.76570	.75401	.75544	.70930	.69712	.68797	.66242	.74478	10.641	
39)	Chlorodibromomethane	1.08810	1.01900	1.03404	1.10793	1.12522	1.10964	1.09281	1.05238	1.02906	1.07313	3.713	
40)	2-Hexanone	-	-	-	.38871	.40744	.39539	.41270	.38137	.34892	.38909	5.809	
41)	Tetrachloroethene	.81479	.61260	.59958	.58574	.59982	.58212	.57345	.54168	.52560	.60393	13.893	
42)	1,1,1,2-Tetrachloroethane	.73704	.62846	.67312	.70268	.68629	.67233	.64705	.62163	.59981	.66316	6.516	
43)	Chlorobenzene	1.26549	.97402	.95796	.93892	.91425	.90278	.87547	.85200	.83929	.94669	13.524	
44)	Ethylbenzene	1.90902	1.50237	1.49962	1.49165	1.46479	1.44417	1.40578	1.35145	1.33017	1.48867	11.379	*
45)	Bromoform	.82038	.76471	.85120	.91061	.87656	.90067	.90210	.85535	.84355	.85835	5.411	
46)	(m+p)-Xylene	.62413	.48363	.48208	.48220	.47014	.45413	.45128	.43753	.43691	.47800	12.001	
47)	Styrene	.95075	.79019	.75463	.77840	.76731	.76330	.75138	.73868	.74047	.78168	8.390	
48)	o-Xylene	.57362	.47323	.46193	.48637	.46485	.45721	.43923	.44093	.43359	.47011	9.021	
49)	1,1,2,2-Tetrachloroethane	1.16048	.96494	.99543	.99778	.94618	.93342	.93967	.92516	.96860	.98230	7.611	
50)	1,2,3-Trichloropropane	1.03708	.93073	.81130	.89284	.84028	.82557	.82410	.79150	.80912	.86340	9.251	
51)	Bromofluorobenzene	1.84045	1.82174	1.85048	1.80956	1.81165	1.78645	1.74244	1.69168	1.73544	1.78777	2.995	
52)	Isopropylbenzene	2.34253	1.84039	1.76426	1.74023	1.73039	1.72021	1.74084	1.68993	1.73918	1.81687	11.070	
53)	Bromobenzene	.96313	.77588	.74250	.78535	.78175	.77388	.76835	.76867	.78985	.79349	8.216	
54)	n-Propylbenzene	.42648	.33079	.35052	.35132	.35104	.35939	.36427	.36233	.37399	.36423	6.974	
55)	2-Chlorotoluene	.52242	.41317	.42271	.42620	.41796	.40883	.41402	.41412	.42560	.42945	8.236	
56)	4-Chlorotoluene	2.47075	2.20202	2.03070	1.97065	1.93200	1.91640	1.94099	1.91258	1.95141	2.03737	9.120	
57)	1,3,5-Trimethylbenzene	2.03361	1.51245	1.49781	1.54050	1.53261	1.51705	1.53197	1.48374	1.52055	1.57448	10.994	
58)	tert-Butylbenzene	1.68414	1.22543	1.17455	1.21057	1.17063	1.16041	1.17091	1.13997	1.17441	1.23522	13.702	
59)	1,2,4-Trimethylbenzene	2.07715	1.60026	1.48389	1.53951	1.52970	1.49443	1.52667	1.47152	1.49824	1.58015	12.041	
60)	sec-Butylbenzene	2.26790	1.71232	1.57670	1.58327	1.57174	1.56701	1.61405	1.56090	1.61840	1.67491	13.570	
61)	1,3-Dichlorobenzene	-	1.12975	1.04084	1.07739	1.01587	.99316	1.03755	1.01138	1.04116	1.04339	4.125	
62)	1,4-Dichlorobenzene	-	1.27523	1.21360	1.22362	1.13703	1.14591	1.17903	1.13990	1.15991	1.18440	4.140	
63)	p-Isopropyltoluene	-	1.46527	1.29600	1.32744	1.31433	1.31212	1.33044	1.29223	1.31773	1.33194	4.168	
64)	1,2-Dichlorobenzene	-	1.14744	1.06340	1.10174	1.03593	1.03044	1.03839	1.01899	1.04389	1.06003	4.186	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0069 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC
65)	n-Butylbenzene	1.98590	1.27720	1.20574	1.17542	1.11271	1.14925	1.16310	1.10435	1.13533	1.25656	22.161	2nd
66)	1,2-Dibromo-3-Chloropropane	-	.47706	.42397	.45200	.43355	.44760	.45420	.43038	.43583	.44443	3.851	
67)	1,2,4-Trichlorobenzene	-	.78506	.68776	.68796	.64122	.66901	.64694	.63031	.63441	.67283	7.540	
68)	Naphthalene	-	-	1.32413	1.27465	1.17163	1.20022	1.15645	1.15314	1.15701	1.20640	5.612	
69)	Hexachlorobutadiene	-	.53965	.49333	.47758	.44755	.45985	.42405	.39971	.40263	.45554	10.488	
70)	1,2,3-Trichlorobenzene	-	.66809	.55503	.55613	.51296	.52844	.50760	.49319	.49298	.53930	10.676	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

0005

Case No:

Instrument ID: HP14

Contractor: MAS Renton

Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
1)	Dichlorodifluoromethane	.998271	.999598	-1.34	1.45		
2)	Chloromethane	.998740	.999191	.124	1.71		**
3)	Vinyl Chloride	.998447	.998510	2.24	2.79	*	
4)	Bromomethane	.998283	.999044	-.715	1.45		
5)	Chloroethane	.999862	.999913	-.139	.405		
6)	Trichlorofluoromethane	.998812	.999682	-.956	1.29		
7)	Acetone	.996286	.999011	-4.81	4.06		
8)	1,1-Dichloroethene	.999889	.999890	.313	.375	*	
9)	Methylene Chloride	.999608	.999831	-.956	.569		
10)	Carbon Disulfide	.999825	.999862	.156	.616		
11)	trans-1,2-Dichloroethene	.999412	.999769	-.095	.765		
12)	1,1-Dichloroethane	.999381	.999768	-.642	.865		**
13)	Vinyl Acetate	.967842	.999652	10.11	-3.49		
14)	2-Butanone	.999358	.999745	.419	3.29		
15)	Chloroform	.999672	.999821	-.407	.703	*	
16)	cis-1,2-Dichloroethene	.999925	.999958	-.0825	.348		
17)	Bromochloromethane	.999668	.999880	-.0290	1.05		
18)	2,2-Dichloropropane	.999634	.999892	-.310	.887		
19)	Dibromofluoromethane	-	-	-	-		
20)	1,1,1-Trichloroethane	.999806	.999918	.0164	.795		
21)	1,2-Dichloroethane-d4	-	-	-	-		
22)	1,2-Dichloroethane	.999502	.999844	-1.45	-.00380		
23)	1,1-Dichloropropene	.999756	.999803	-.0111	.492		
24)	Carbon Tetrachloride	.999773	.999849	.523	1.14		
25)	Benzene	.999971	.999977	.243	.0629		
26)	Dibromomethane	.999777	.999889	.117	.887		
27)	1,2-Dichloropropane	.999923	.999945	.352	.00575	*	
28)	Trichloroethene	.999716	.999786	-.142	.481		
29)	Bromodichloromethane	.999690	.999839	.322	1.21		
30)	2-Chloroethylvinylether	.999229	.999745	.0121	1.65		
31)	cis-1,3-Dichloropropene	.999731	.999841	1.39	.636		
32)	4-Methyl-2-Pentanone	.998628	.999523	-.529	1.70		
33)	trans-1,3-Dichloropropene	.999582	.999730	.0238	.906		
34)	1,1,2-Trichloroethane	.999598	.999734	-.109	.670		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

0036

Case No: Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
35)	Toluene-d8	-	-	-	-		
36)	Toluene	.999700	.999821	-.0826	.729	*	
37)	1,2-Dibromoethane	.999118	.999676	-.373	1.34		
38)	1,3-Dichloropropane	.999611	.999951	-1.58	-.103		
39)	Chlorodibromomethane	.999588	.999988	-1.19	.340		
40)	2-Hexanone	.995596	.999270	-4.77	5.12		
41)	Tetrachloroethene	.999284	.999957	-1.97	.191		
42)	1,1,1,2-Tetrachloroethane	.999264	.999998	-1.97	.162		
43)	Chlorobenzene	.999707	.999992	-1.45	-.323		**
44)	Ethylbenzene	.999658	.999979	-1.58	-.172	*	
45)	Bromoform	.999538	.999920	-.956	.512		**
46)	(m+p)-Xylene	.999892	.999964	-1.98	-.654		
47)	Styrene	.999962	.999980	-.586	-.260		
48)	o-Xylene	.999909	.999968	-.981	-.379		
49)	1,1,2,2-Tetrachloroethane	.999626	.999957	.311	-.840		**
50)	1,2,3-Trichloropropane	.999839	.999841	-.691	-.592		
51)	Bromofluorobenzene	-	-	-	-		
52)	Isopropylbenzene	.999894	.999903	-.124	-.351		
53)	Bromobenzene	.999758	.999891	.382	-.509		
54)	n-Propylbenzene	.999811	.999951	.735	-.135		
55)	2-Chlorotoluene	.999832	.999971	.380	-.493		
56)	4-Chlorotoluene	.999923	.999946	-.0349	-.396		
57)	1,3,5-Trimethylbenzene	.999873	.999879	-.160	-.336		
58)	tert-Butylbenzene	.999835	.999861	-.122	-.507		
59)	1,2,4-Trimethylbenzene	.999883	.999883	-.323	-.276		
60)	sec-Butylbenzene	.999761	.999827	.229	-.374		
61)	1,3-Dichlorobenzene	.999902	.999873	.323	-.446		
62)	1,4-Dichlorobenzene	.999882	.999882	-.191	-.257		
63)	p-Isopropyltoluene	.999900	.999902	-.107	-.238		
64)	1,2-Dichlorobenzene	.999887	.999924	-.0668	-.627		
65)	n-Butylbenzene	.999752	.999752	-.488	-.456		
66)	1,2-Dibromo-3-Chloropropane	.999731	.999796	-.572	.152		
67)	1,2,4-Trichlorobenzene	.999890	.999921	-1.00	-.485		
68)	Naphthalene	.999951	.999951	-1.03	-.982		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

00007

Case No:

Instrument ID: HP#4

Contractor: MAS Renton

Calibration Date: 10/28/99

Contract No:

Minimum $\overline{RF}$ for SPCC is 0.30

Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
69)	Hexachlorobutadiene	.999360	.999650	-2.71	-1.05		
70)	1,2,3-Trichlorobenzene	.999851	.999935	-1.51	-.639		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/5/99 | I.S. + S.S.: 530-41-2 | Instrument I.D.: HP #4

Shift: 2nd | I.S.: | Tune File: BF1025

Analyst: AM/SK | SPIKE: 530-42-1 | Sequence: B1105B

TCLP SPIKE:

GC COLUMN: J & W DB-VRX 75m Capillary Column

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	1557	1	MPFB	7B0207		BFB 50ng	W	5ml	1	+20ul 530-42-2 / 50ml H2O
2		1	M8260C	08		VSTD050 on 11/5/99				+50ul 530-40-1/50ml H2O 530-39-2 AM 11/8/99
3		1		09		VBLK110599A				
4		2		10		MB/BS ABS				+20ul 530-42-1 / 50ml H2O
5		3		11	<2	821867-1 99PRDA-106-GW				
6		4		12		-2 -107-GW				
7		5		13		910057-9 TB				
8		6		14		911017-5 TB				
9		7		15		821875-1 99PRDA-108-GW				
10		8		16		-2 -109-GW				
11		10		17		-3 -110-GW				
12		11		18		-4 -111-GW				
13		12		19		-5 -112-GW				Redo 10x for TCE
14		13		20		-6 -113-GW				
15		14		21		-7 -114-GW				
16	03:27	15		22		821867-1MS -106-GW				+17ml 530-42-1 spiked into VOA vial
17	04:12	15		23		-1MSD				
18		16		24		911001-1 FRIDGE VOA				
19	05:43	17		25		-2 VOA				
20										
21						GK				
22										
23						11/10/99				
24										

ID File: B14060

Cal File: BC4060

Reviewed By: _____

Continuing Calibration Check
HSL Compounds

Case No: _____ Calibration Date: 11/05/99

Contractor: HSL Renton Time: 16:48

Contract No: _____ Laboratory ID: >B0208

Instrument ID: HP'4 Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

chloromethane = 0.10

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.04173	.04943	.91		
Chloromethane	.13975	.11577	17.16		**
Vinyl Chloride	.22740	.24272	6.71	*	
Bromomethane	.30299	.26733	11.77		
Chloroethane	.10077	.10340	2.54		
Trichlorofluoromethane	.93897	1.18362	26.06		
Acetone	.17174	.09533	44.49		
1,1-Dichloroethene	.21896	.19352	11.62	*	
Methylene Chloride	.22500	.19993	11.10		
Carbon Disulfide	.52706	.46000	12.72		
trans-1,2-Dichloroethene	.24720	.22000	10.73		
1,1-Dichloroethane	.54151	.50019	7.63		**
Vinyl Acetate	.14000	.48019	312.99		
2-Butanone	.13886	.11353	16.08		
Chloroform	.07309	.01918	.46	*	
cis-1,2-Dichloroethene	.26145	.23646	9.56		
Bromochloromethane	.20031	.20004	.14		
2,2-Dichloropropane	.73563	.73570	.01		
Dibromofluoromethane	.74290	.78959	5.57		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.85064	4.34		
1,2-Dichloroethane-d4	.79285	.91543	14.74		
1,2-Dichloroethane	.90716	.86000	5.07		
1,1-Dichloropropene	.48148	.43070	3.10		
Carbon Tetrachloride	.78243	.96371	23.17		
Benzene	.62114	.58297	6.15		
Dibromomethane	.43321	.49549	14.38		
1,2-Dichloropropane	.28024	.26340	6.70	*	
Trichloroethene	.43132	.43042	.21		
Bromodichloromethane	.94373	1.03710	10.26		
2-Chloroethylvinylether	.16209	.13441	17.06		
trans-1,3-Dichloropropene	.45034	.58942	28.60		
4-Methyl-2-Pentanone	.28041	.32017	10.63		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: | Calibration Date: 11/05/99

Contractor: HAC Renton | Time: 10:48

Contract No: | Laboratory ID: >R0208

Instrument ID: HP44 | Initial Calibration Date: 10/28/99

Minimum $\overline{RF}$ for SPCC is 0.30 | Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.69499	33.29		
1,1,2-Trichloroethane	.28367	.31295	10.32		
Toluene-d8	.96012	1.02773	6.30		
Toluene	.44393	.46608	4.99	*	
1,2-Dibromoethane	.55271	.67943	22.93		
1,3-Dichloropropane	.74478	.76039	2.10		
Chlorodibromomethane	1.07313	1.23221	14.82		
2-Hexanone	.38909	.32947	15.32		
Tetrachloroethene	.60393	.61189	1.32		
1,1,1,2-Tetrachloroethane	.68316	.72483	9.30		
Chlorobenzene	.94009	.90096	4.83		**
Ethylbenzene	1.49867	1.46246	1.76	*	
Bromoform	.85035	1.03411	20.48		**
(m+p)-Xylene	.47800	.45315	5.20	(Conc=100.00)	
Styrene	.78108	.77480	.08		
o-Xylene	.47011	.47543	1.13		
1,1,2,2-Tetrachloroethane	.98238	1.12150	14.17		**
1,2,3-Trichloropropane	.86340	.85921	.48		
Bromofluorobenzene	1.78777	1.68538	5.73		
Isopropylbenzene	1.81687	1.62782	10.41		
Bromobenzene	.79349	.77084	2.85		
n-Propylbenzene	.36423	.33630	7.67		
2-Chlorotoluene	.42945	.39814	7.29		
4-Chlorotoluene	2.03737	1.85124	9.14		
1,3,5-Trimethylbenzene	1.57440	1.43990	8.54		
tert-Butylbenzene	1.23522	1.10043	10.91		
1,2,4-Trimethylbenzene	1.50815	1.41474	10.47		
sec-Butylbenzene	1.67481	1.47528	11.91		
1,3-Dichlorobenzene	1.04339	.98815	6.86		
1,4-Dichlorobenzene	1.10440	1.10811	6.44		
p-Isopropyltoluene	1.33194	1.23845	7.02		
1,2-Dichlorobenzene	1.06003	.98426	7.15		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/05/99

Contractor: MAS Renton Time: 16:40

Contract No: Laboratory ID: >B0208

Instrument ID: HP44 Initial Calibration Date: 10/28/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25050	1.10073	3.47		
1,2-Dibromo-3-Chloropropane	.44443	.46968	5.68		
1,2,4-Trichlorobenzene	.67283	.67253	.05		
Naphthalene	1.20646	1.27347	5.55		
Hexachlorobutadiene	.45554	.46547	2.18		
1,2,3-Trichlorobenzene	.53930	.56301	4.40		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (4) SPCC - System Performance Check Compounds (44)

00312

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/8/99 | I.S. + S.S.: 530.41.2 | Instrument I.D.: HP #4

Shift: 1st | I.S.: | Tune File: IF1025

Analyst: SK | SPIKE: 530.42.1 | Sequence: B1108A

TCLP SPIKE:

GC COLUMN: J & W DB-VRX 75m Capillary Column

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	08:02	1	MBFB	>B0270		BFB 50ng	W	5ml	1	+20µl 530.42.2/50ml H2O
2		1	MSVOA	71		VSTD010 (App IX)				+10µl 530.43.2/50 ml H2O
3		1		72		VSTD020				+20µl
4		1		73		VSTD010				+10µl
5		1		74		VSTD020				+20µl
6		1		75		VSTD050				+50µl
7		1		76		VSTD050				+ 50µl 530.39.2/50ml H2O
8		1		77		VBLK1108A				
9		2		78		" ABS				+20µl 530.42.1/50ml H2O
10		3		79	<2	821875-SDL 99RDK-112-GW				
11		4		80		910061-1 CRLF-MW05-A-DUP				
12		5		81		-2 P1				
13		6		82		-3 P3				
14	16:56	7		83		-4 P3 D				
15		8		84		910062-11 MW05 E				NOT ANALYZED
16										
17										
18										
19										
20										
21										
22										
23										
24										

11/8/99

ID File: BI4060/IDAPP9

Cal File: BC4000/CALAPP

Reviewed By: _____

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/08/99

Contractor: HSC Renton Time: 11:30

Contract No: Laboratory ID: >R0276

Instrument ID: HP14 Initial Calibration Date: 10/28/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%
Chloromethane = 0.10

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.04173	.05019	1.72		
Chloromethane	.13375	.13527	3.21		**
Vinyl Chloride	.22740	.26190	15.14	*	
Bromomethane	.30209	.18420	39.20		
Chloroethane	.10677	.13520	26.70		
Trichlorofluoromethane	.93897	1.16877	24.47		
Acetone	.17174	.14202	17.31		
1,1-Dichloroethene	.21806	.22568	3.07	*	
Methylene Chloride	.22506	.24296	7.95		
Carbon Disulfide	.52706	.56320	6.86		
trans-1,2-Dichloroethene	.24220	.25477	3.00		
1,1-Dichloroethane	.54151	.54856	1.30		**
Vinyl Acetate	.14060	.49907	329.20		
2-Butanone	.13806	.16738	20.54		
Chloroform	.02309	.04080	2.15	*	
cis-1,2-Dichloroethene	.26145	.27703	5.96		
Bromochloromethane	.20031	.20510	2.43		
2,2-Dichloropropane	.73563	.71413	2.92		
Dibromofluoromethane	.74796	.83129	11.14		(Conc=50.00)
1,1,1-Trichloroethane	.91525	.92941	1.74		
1,2-Dichloroethane-d4	.79705	.75486	5.39		
1,2-Dichloroethane	.90716	.74283	12.23		
1,1-Dichloropropene	.40140	.45892	0.33		
Carbon Tetrachloride	.78243	.76118	2.71		
Benzene	.07114	.08214	3.86		
Dibromomethane	.43321	.46553	7.46		
1,2-Dichloropropane	.28024	.26945	0.68	*	
Trichloroethene	.13437	.41733	3.92		
Bromodichloromethane	.94373	.93388	1.04		
2-Chloroethylvinylether	.16289	.09481	47.68		
cis-1,3-Dichloropropene	.45834	.51275	11.87		
4-Methyl-2-Pentanone	.28941	.28082	2.97		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: ----------

Calibration Date: 11/08/89

Contractor: MAS Renton

Time: 11:36

Contract No: ----------

Laboratory ID: >B0270

Instrument ID: HP44

Initial Calibration Date: 10/28/89

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.58190	11.61		
1,1,2-Trichloroethane	.28367	.28722	1.25		
Toluene-d8	.96012	.94923	1.75		
Toluene	.44393	.43574	1.84	*	
1,2-Dibromoethane	.55271	.58759	6.31		
1,3-Dichloropropane	.74478	.76910	3.26		
Chlorodibromomethane	1.07313	1.10523	2.99		
2-Hexanone	.38909	.36967	4.99		
Tetrachloroethene	.60393	.54193	10.27		
1,1,1,2-Tetrachloroethane	.56316	.52533	5.70		
Chlorobenzene	.94009	.92721	2.06		
Ethylbenzene	1.48867	1.46412	1.65	*	
Bromoform	.05035	.03720	2.46	**	
(m+p)-Xylene	.47800	.46736	2.23		(Conc=100.00)
Styrene	.78160	.80827	3.40		
o-Xylene	.47011	.47733	1.54		
1,1,2,2-Tetrachloroethane	.98230	1.07790	9.74	**	
1,2,3-Trichloropropane	.86340	.89009	3.09		
Bromofluorobenzene	1.78777	1.67786	6.19		
Isopropylbenzene	1.81687	1.68948	7.01		
Bromobenzene	.79349	.74517	6.09		
n-Propylbenzene	.36423	.36280	.37		
2-Chlorotoluene	.42845	.41741	2.58		
4-Chlorotoluene	2.03737	1.86001	8.71		
1,3,5-Trimethylbenzene	1.57448	1.46081	6.89		
tert-Butylbenzene	1.23522	1.11194	9.98		
1,2,4-Trimethylbenzene	1.58015	1.45418	7.97		
sec-Butylbenzene	1.67481	1.51796	9.37		
1,3-Dichlorobenzene	1.04339	.98174	5.91		
1,4-Dichlorobenzene	1.10448	1.10839	2.89		
p-Isopropyltoluene	1.33194	1.25296	5.93		
1,2-Dichlorobenzene	1.06003	1.00252	5.42		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: | Calibration Date: 11/08/99

Contractor: MAS Renton | Time: 11:36

Contract No: | Laboratory ID: >D0276

Instrument ID: HP14 | Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25056	1.09795	3.71		
1,2-Dibromo-3-Chloropropane	.44443	.43636	1.68		
1,2,4-Trichlorobenzene	.67283	.55734	17.17		
Naphthalene	1.20646	1.18654	1.65		
Hexachlorobutadiene	.45554	.33587	26.27		
1,2,3-Trichlorobenzene	.53930	.46084	14.55		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821878
UST - 026

November 30, 1999

URS Greiner/Woodward-Clyde
3501 Denali Street
Suite 101
Anchorage AK 99503

Attention : Scott Kendall

Project Number : 74F0E9408U.00/05700

Project Name : OUB Long Term Groundwater Sampling

Dear Mr. Kendall:

On November 5, 1999, MultiChem Analytical Services received 11 samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Sincerely,

Gary A. Morelli
Project Manager

GAM/hal/trm

Enclosure

560 Naches Avenue SW, Suite 101, Renton, Washington 98055-2200 • 425-228-8335 • FAX 425-228-8336 • 1-800-609-0580 • info@multichem.com

MAS I.D. # 821878

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ANALYTICAL SERVICES

SAMPLE CROSS REFERENCE SHEET

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

MAS #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
821878-1	99PRDA-115-GW	11/02/99	WATER
821878-2	99PRDA-116-GW	11/02/99	WATER
821878-3	99PRDA-117-GW	11/02/99	WATER
821878-4	99PRDA-118-GW	11/02/99	WATER
821878-5	99PRDA-119-GW	11/02/99	WATER
821878-6	99PRDA-120-GW	11/02/99	WATER
821878-7	99PRDA-121-GW	11/03/99	WATER
821878-8	99PRDA-122-GW	11/03/99	WATER
821878-9	99PRDA-123-GW	11/03/99	WATER
821878-10	99PRDA-124-GW	11/03/99	WATER
821878-11	99PRDA-TB	11/03/99	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	11

MAS STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

MAS I.D. # 821878

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ANALYTICAL SERVICES

ANALYTICAL SCHEDULE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

ANALYSIS	TECHNIQUE	REFERENCE	LAB
VOLATILE ORGANICS ANALYSIS	GCMS	EPA 8260B	R

R = MAS - Renton
ANC = MAS - Anchorage
SUB = Subcontract

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The percent recovery of the matrix spiking compound trichloroethene fell below MultiChem's current recovery range in the matrix spike/matrix spike duplicate (MS/MSD) associated with the samples in this accession. These anomalies were attributed to the high concentration of trichloroethene detected in the unspiked sample, and were therefore labeled "G" for reporting purposes, and no further corrective action was performed.

The percent recovery of the matrix spiking compound trichloroethene exceeded the upper limit of the calibration curve in the MS/MSD associated with the samples in this accession. The MS/MSD were not reanalyzed at a dilution, and the affected concentrations have been "C" flagged on the appropriate MS/MSD summary form. No further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	117	50 - 150
1,2-DICHLOROETHANE-D4	111	81 - 130
TOLUENE-D8	103	80 - 120
BROMOFLUOROBENZENE	100	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	116	81 - 130
TOLUENE-D8	106	80 - 120
BROMOFLUOROBENZENE	100	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-115-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-115-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	40
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	116	50 - 150
1,2-DICHLOROETHANE-D4	111	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	106	75 - 118

MAS I.D. # 821878-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-116-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-116-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	36
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	119	50 - 150
1,2-DICHLOROETHANE-D4	112	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	106	75 - 118

MAS I.D. # 821878-3

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-117-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	<1.0	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	<1.0	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	4.2	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	<1.0	
CIS-1,2-DICHLOROETHENE	34	
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	240 D6	
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	2.8	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	<1.0	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-3

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-117-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
CHLOROBENZENE	<1.0	
ETHYLBENZENE	<1.0	
BROMOFORM	<3.0	
STYRENE	<1.0	
TOTAL XYLENES	<1.0	
1,1,2,2-TETRACHLOROETHANE	410	D6
1,2,3-TRICHLOROPROPANE	<1.0	
ISOPROPYLBENZENE	<1.0	
BROMOBENZENE	<1.0	
N-PROPYLBENZENE	<1.0	
2-CHLOROTOLUENE	<1.0	
4-CHLOROTOLUENE	<1.0	
1,3,5-TRIMETHYLBENZENE	<1.0	
TERT-BUTYLBENZENE	<1.0	
1,2,4-TRIMETHYLBENZENE	<1.0	
SEC-BUTYLBENZENE	<1.0	
1,3-DICHLOROBENZENE	<2.0	
1,4-DICHLOROBENZENE	<2.0	
P-ISOPROPYLTOLUENE	<2.0	
1,2-DICHLOROBENZENE	<2.0	
N-BUTYLBENZENE	<1.0	
1,2-DIBROMO-3-CHLOROPROPANE	<3.0	
1,2,4-TRICHLOROBENZENE	<5.0	
NAPHTHALENE	<5.0	
HEXACHLOROBUTADIENE	<3.0	
1,2,3-TRICHLOROBENZENE	<5.0	

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	112	81 - 130
TOLUENE-D8	103	80 - 120
BROMOFLUOROBENZENE	105	75 - 118

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-4

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-118-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	1.3
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	10
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	21
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878-4

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-118-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
CHLOROBENZENE	<1.0	
ETHYLBENZENE	<1.0	
BROMOFORM	<3.0	
STYRENE	<1.0	
TOTAL XYLENES	<1.0	
1,1,2,2-TETRACHLOROETHANE	850	D6
1,2,3-TRICHLOROPROPANE	<1.0	
ISOPROPYLBENZENE	<1.0	
BROMOBENZENE	<1.0	
N-PROPYLBENZENE	<1.0	
2-CHLOROTOLUENE	<1.0	
4-CHLOROTOLUENE	<1.0	
1,3,5-TRIMETHYLBENZENE	<1.0	
TERT-BUTYLBENZENE	<1.0	
1,2,4-TRIMETHYLBENZENE	<1.0	
SEC-BUTYLBENZENE	<1.0	
1,3-DICHLOROBENZENE	<2.0	
1,4-DICHLOROBENZENE	<2.0	
P-ISOPROPYLTOLUENE	<2.0	
1,2-DICHLOROBENZENE	<2.0	
N-BUTYLBENZENE	<1.0	
1,2-DIBROMO-3-CHLOROPROPANE	<3.0	
1,2,4-TRICHLOROBENZENE	<5.0	
NAPHTHALENE	<5.0	
HEXACHLOROBUTADIENE	<3.0	
1,2,3-TRICHLOROBENZENE	<5.0	

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	112	81 - 130
TOLUENE-D8	96	80 - 120
BROMOFLUOROBENZENE	107	75 - 118

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-5

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-119-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	<1.0	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	3.7	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	59	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	1.2	
CIS-1,2-DICHLOROETHENE	290	D6
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	860	D6
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	21	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	2.4	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-5

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-119-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
CHLOROBENZENE	<1.0	
ETHYLBENZENE	<1.0	
BROMOFORM	<3.0	
STYRENE	<1.0	
TOTAL XYLENES	<1.0	
1,1,2,2-TETRACHLOROETHANE	1500	D6
1,2,3-TRICHLOROPROPANE	<1.0	
ISOPROPYLBENZENE	<1.0	
BROMOBENZENE	<1.0	
N-PROPYLBENZENE	<1.0	
2-CHLOROTOLUENE	<1.0	
4-CHLOROTOLUENE	<1.0	
1,3,5-TRIMETHYLBENZENE	<1.0	
TERT-BUTYLBENZENE	<1.0	
1,2,4-TRIMETHYLBENZENE	<1.0	
SEC-BUTYLBENZENE	<1.0	
1,3-DICHLOROBENZENE	<2.0	
1,4-DICHLOROBENZENE	<2.0	
P-ISOPROPYLTOLUENE	<2.0	
1,2-DICHLOROBENZENE	<2.0	
N-BUTYLBENZENE	<1.0	
1,2-DIBROMO-3-CHLOROPROPANE	<3.0	
1,2,4-TRICHLOROBENZENE	<5.0	
NAPHTHALENE	<5.0	
HEXACHLOROBUTADIENE	<3.0	
1,2,3-TRICHLOROBENZENE	<5.0	

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	120	50 - 150
1,2-DICHLOROETHANE-D4	114	81 - 130
TOLUENE-D8	99	80 - 120
BROMOFLUOROBENZENE	105	75 - 118

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-6

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-120-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	<1.0	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	3.5	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	58	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	1.2	
CIS-1,2-DICHLOROETHENE	290	D6
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	860	D6
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	20	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	2.4	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-6

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/02/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-120-GW	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
CHLOROBENZENE	<1.0	
ETHYLBENZENE	<1.0	
BROMOFORM	<3.0	
STYRENE	<1.0	
TOTAL XYLENES	<1.0	
1,1,2,2-TETRACHLOROETHANE	1400	D6
1,2,3-TRICHLOROPROPANE	<1.0	
ISOPROPYLBENZENE	<1.0	
BROMOBENZENE	<1.0	
N-PROPYLBENZENE	<1.0	
2-CHLOROTOLUENE	<1.0	
4-CHLOROTOLUENE	<1.0	
1,3,5-TRIMETHYLBENZENE	<1.0	
TERT-BUTYLBENZENE	<1.0	
1,2,4-TRIMETHYLBENZENE	<1.0	
SEC-BUTYLBENZENE	<1.0	
1,3-DICHLOROBENZENE	<2.0	
1,4-DICHLOROBENZENE	<2.0	
P-ISOPROPYLTOLUENE	<2.0	
1,2-DICHLOROBENZENE	<2.0	
N-BUTYLBENZENE	<1.0	
1,2-DIBROMO-3-CHLOROPROPANE	<3.0	
1,2,4-TRICHLOROBENZENE	<5.0	
NAPHTHALENE	<5.0	
HEXACHLOROBUTADIENE	<3.0	
1,2,3-TRICHLOROBENZENE	<5.0	

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	113	81 - 130
TOLUENE-D8	98	80 - 120
BROMOFLUOROBENZENE	106	75 - 118

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-7

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-121-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	28
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	2.4
CIS-1,2-DICHLOROETHENE	98
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	680 D6
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	8.6
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	5.3
1,1,1,2-TETRACHLOROETHANE	<1.0

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-7

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-121-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
CHLOROBENZENE	<1.0	
ETHYLBENZENE	<1.0	
BROMOFORM	<3.0	
STYRENE	<1.0	
TOTAL XYLENES	<1.0	
1,1,2,2-TETRACHLOROETHANE	830	D6
1,2,3-TRICHLOROPROPANE	<1.0	
ISOPROPYLBENZENE	<1.0	
BROMOBENZENE	<1.0	
N-PROPYLBENZENE	<1.0	
2-CHLOROTOLUENE	<1.0	
4-CHLOROTOLUENE	<1.0	
1,3,5-TRIMETHYLBENZENE	<1.0	
TERT-BUTYLBENZENE	<1.0	
1,2,4-TRIMETHYLBENZENE	<1.0	
SEC-BUTYLBENZENE	<1.0	
1,3-DICHLOROBENZENE	<2.0	
1,4-DICHLOROBENZENE	<2.0	
P-ISOPROPYLTOLUENE	<2.0	
1,2-DICHLOROBENZENE	<2.0	
N-BUTYLBENZENE	<1.0	
1,2-DIBROMO-3-CHLOROPROPANE	<3.0	
1,2,4-TRICHLOROBENZENE	<5.0	
NAPHTHALENE	<5.0	
HEXACHLOROBUTADIENE	<3.0	
1,2,3-TRICHLOROBENZENE	<5.0	

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	120	50 - 150
1,2-DICHLOROETHANE-D4	114	81 - 130
TOLUENE-D8	98	80 - 120
BROMOFLUOROBENZENE	108	75 - 118

D6 = Value from a 50 fold diluted analysis.

MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821878-8

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-122-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	15
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	1.8
CIS-1,2-DICHLOROETHENE	58
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	3.7 0.0037
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	1600 D6
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	4.4
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	29
1,1,1,2-TETRACHLOROETHANE	<1.0

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821878-8

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-122-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	810 D6
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	121	50 - 150
1,2-DICHLOROETHANE-D4	113	81 - 130
TOLUENE-D8	95	80 - 120
BROMOFLUOROBENZENE	104	75 - 118

D6 = Value from a 50 fold diluted analysis.

MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821878-9

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-123-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	1.2	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	10	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	110	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	2.1	
CIS-1,2-DICHLOROETHENE	1200	D7
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	3400	D7
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	21	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	38	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D7 = Value from a 100 fold diluted analysis.

MAS I.D. # 821878-9

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-123-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	14000 D7
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	120	50 - 150
1,2-DICHLOROETHANE-D4	113	81 - 130
TOLUENE-D8	98	80 - 120
BROMOFLUOROBENZENE	103	75 - 118

D7 = Value from a 100 fold diluted analysis.

MAS I.D. # 821878-10

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-124-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	<5.0	
VINYL CHLORIDE	4.2	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	33	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	480	D7
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	12	
CIS-1,2-DICHLOROETHENE	2500	D7
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	12	0.012 mg/L
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	9100	D7
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	120	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	120	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D7 = Value from a 100 fold diluted analysis.

MAS I.D. # 821878-10

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-124-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	15000 D9
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	122	50 - 150
1,2-DICHLOROETHANE-D4	119	81 - 130
TOLUENE-D8	88	80 - 120
BROMOFLUOROBENZENE	105	75 - 118

D9 = Value from a 500 fold diluted analysis.

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/16/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	110	50 - 150
1,2-DICHLOROETHANE-D4	96	81 - 130
TOLUENE-D8	104	80 - 120
BROMOFLUOROBENZENE	100	75 - 118

MAS I.D. # 821878-11

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-TB	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821878-11

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/03/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/05/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-TB	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	108	81 - 130
TOLUENE-D8	101	80 - 120
BROMOFLUOROBENZENE	107	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/12/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	54.5	109	N/A	N/A	N/A
BENZENE	<1.00	50.0	50.4	101	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	46.7	93	N/A	N/A	N/A
TOLUENE	<1.00	50.0	51.1	102	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	50.7	101	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	119	N/A	50 - 150
1,2-DICHLOROETHANE-D4	108	N/A	81 - 130
TOLUENE-D8	103	N/A	80 - 120
BROMOFLUOROBENZENE	97	N/A	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/13/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	54.7	109	N/A	N/A	N/A
BENZENE	<1.00	50.0	50.1	100	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	49.0	98	N/A	N/A	N/A
TOLUENE	<1.00	50.0	52.5	105	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	49.2	98	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	121	N/A	50 - 150
1,2-DICHLOROETHANE-D4	113	N/A	81 - 130
TOLUENE-D8	104	N/A	80 - 120
BROMOFLUOROBENZENE	98	N/A	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/16/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	51.3	103	N/A	N/A	N/A
BENZENE	<1.00	50.0	49.8	100	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	43.1	86	N/A	N/A	N/A
TOLUENE	<1.00	50.0	49.3	99	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	50.9	102	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	111	N/A	50 - 150
1,2-DICHLOROETHANE-D4	97	N/A	81 - 130
TOLUENE-D8	105	N/A	80 - 120
BROMOFLUOROBENZENE	99	N/A	75 - 118

MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : 821878-3
DATE EXTRACTED : N/A
DATE ANALYZED : 11/12/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	57.3	115	56.8	114	1
BENZENE	<1.00	50.0	51.4	103	50.6	101	2
TRICHLOROETHENE	243 D6	50.0	280 C	74G	267 C	48G	5
TOLUENE	<1.00	50.0	51.7	103	51.6	103	0
CHLOROBENZENE	<1.00	50.0	48.3	97	48.6	97	1

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	72 - 137	20
BENZENE	80 - 133	20
TRICHLOROETHENE	79 - 120	20
TOLUENE	72 - 137	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	122	122	50 - 150
1,2-DICHLOROETHANE-D4	121	116	81 - 130
TOLUENE-D8	105	105	80 - 120
BROMOFLUOROBENZENE	108	108	75 - 118

D6 = Value from a 50 fold diluted analysis.
C = Estimated, value above linear range.
G = Out of limits due to high levels of target analytes in sample.

MultiChem Analytical Services

To Renton

2000 W. INTL. AIRPORT RD., # C-7
ANCHORAGE, AK 99502
Phone: (907)248-8273 Fax: (907)248-8274

ACCESSION #: 821878

Page: 1 of 1

CHAIN OF CUSTODY

COMPANY: URS Grainer/Woodward Clyde
ADDRESS: 3501 Denali Street Ste 101
Anchorage AK, 99503
PHONE: (907) 561-1020 FAX: (907) 563-3198
REPORT TO: Scott Kendall
PROJECT NAME: OUB Long Term Groundwater Sampling
PROJECT #: ~~74~~ 74FOE940BU.00 / 05700
MAS WILL: ~~DISPOSE~~ / RETURN samples (circle one)

SAMPLE ID	DATE	TIME	MATRIX	LAB #
99PRDA-115-GW	11-2-99	1032	Water	01
99PRDA-116-GW	11-02-99	1115	Water	02
99PRDA-117-GW (ms/msd)	11-02-99	1245	WATER	03
99PRDA-118-GW	11-02-99	1500	WATER	04
99PRDA-119-GW	11-02-99	1710	WATER	05
* 99PRDA-120-GW	11-02-99	1740	WATER	06
99PRDA-121-GW	11-03-99	0959	WATER	07
99PRDA-122-GW	11-03-99	1125	WATER	08
99PRDA-123-GW	11-03-99	1325	WATER	09
99PRDA-124-GW	11-03-99	1455	WATER	10
99PRDA-TB	11-03-99		Water	11

MAS-Alaska Analyses: GRO by 8015M; BTEX by 8021M; GRO&BTEX/8015M/8021M; DRO by 8100M; DRO-EXTENDED by 8100M; GRO by AK101; GRO/BTEX by AK101/8021; DRO by AK102; RRO by AK103; DRO/RRO by AK102/103; Flashpoint/Ignitability; pH

MAS-WA or Subcontract Analyses: TRPH by 418.1; 8260-GC/MS Volatiles; 8270-GC/MS Semivolatiles; 8081/8082-Pesticides&PCB; PCBs only by 8082; 8021-Arom/Halog Volatiles; Total Metals: As,Cd,Cr,Pb; TCLP-RCRA 8 Metals/1311; RCRA 8 Metals; Metals (list below) *; TOC

MS/MSD

Total # of Containers: 3, 3, 9, 3, 3, 3, 3, 3, 3, 3, 3

Turnaround time (TAT):
STANDARD: ☒ (Winter: 5 WD FAX FUELS, 10 WD OTHER)
RUSH (check one): 24 HR ☐ 48 HR ☐ 72 HR ☐ 1 WK ☐
PURCHASE ORDER #:

Report type :
STANDARD (Level II) ☐
or with Raw Data Pkg.: ADEC ☐ ACOE ☒ CHRO's ☐
Electronic Data Disc (EDD) ☒

Sample Receipt:
TOTAL # CONTAINERS RECEIVED:
COOLER SEALS PRESENT ? Y (N)
IF SO, INTACT? (N/A) Y N
COOLER TEMP: 3.2°C
CONTAINERS REC'D INTACT? Y N
RECEIVED VIA: Hand carry

Relinquished by:
Signature: [signature] Date: 11/4/99
Printed name: Scott Kendall Time: 9:20
Company: URSGWC

Received by:
Signature: [signature] Date: 11/4/99
Printed name: Lorraine Andela Time: 0920
Company: MultiChem AK

Relinquished by:
Signature: [signature] Date: 11/4/99
Printed name: Lorraine Andela Time: 14:20
Company: MultiChem-AK

Received at Laboratory by:
Signature: [signature] Date: 11/5/99
Printed name: DENNIS PETERSON Time: 1130
Company: MAS

SPECIAL INSTRUCTIONS:
PRESERVATIVE: HCl
* 120GW - Time on label is 18:30

* Metals needed (see above):

AK041.01

NON-CONFORMANCES? (Y) N 2
(if Y see other side)

MultiChem Analytical Services

SAMPLE LOG-IN CHECKLIST

DATE: 11/5/99
TIME: 1130
INITIALS: JD

ACCESSION NO. 821878
CLIENT: URSGWC
PROJECT: OUB LT GW Sampling

Shipping:

Type:
X Cooler
___ Box
___ Other

COC Seals:
X Ship. Cont. — Intact? (Y) N
___ On Bottles — Y N
___ None

Packing Material:
___ Styrofoam
X Bubble Bags
___ Foam Vial Packs
___ Other ___

Refrigerant: / **Frozen?**
X Gel Ice Pack — (Y) N
___ Loose Ice — Y N
___ Other — Y N
___ None

Received Via:
___ Hand Delivery
___ Federal Express
___ Airborne
___ Other: ___
X Courier
___ UPS
___ Taxi
X Goldstreak

Sample Information:

Samp. #	Bottle #
11	39

Type: Soil, (Water), Product, Other

Soil VOAs — 0 headspace Y N N ___
(Water VOAs) — 0 headspace Y (N) N 2
Preserved? (Y) N ___
Trip blanks? (Y) N ___

Condition of Samples:
Containers:
Intact? (Bottle/Lid) (Y) N
Correct Type? (Y) N

CA# ___ ___

Waters Preserved? (if needed) Y N N ___

ID's Match C.O.C. (Y) N N ___

Temperature: 6.5 C ___ CA NO.
(See corrective action on reverse side for explanation if temperature is outside of the MAS recommended range.)

LAB USE ONLY ... NOTICE ... SENDOUTS NEEDED BY ...
☐ COC/TAT DOES NOT MATCH NOTICE ... ☐ NEED TEST(S) VERIFIED BY CLIENT

COMMENTS: ___

USACE
COOLER RECEIPT FORM

Client: URSGWC Accession #: 821878

Project: OU3 LT GW Sampling

Cooler received on 11/5/09 and opened on 11/5/09

by DELANEY PETERSON Signature Delaney Peterson

1. Were custody seals on outside of cooler and intact? ..... (YES) NO
   a. If YES, how many and where: 2 on outside
   b. Were signature and date correct? ..... (YES) NO
2. Were custody papers taped to lid inside cooler? ..... (YES) NO
3. Were custody papers properly filled out (ink, signed, etc.)? ..... (YES) NO
4. Did you sign custody papers in the appropriate place? ..... (YES) NO
5. Did you attach shipper's packing slip to this form? ..... YES (NO)
6. What kind of packing material was used? Bubble Bags
7. Was sufficient ice used (if appropriate)? Temp 6.5 °C ..... YES NO
8. Were all bottles sealed in separate plastic bags? ..... YES (NO)
9. Did all bottles arrive in good condition (unbroken)? ..... (YES) NO
10. Were all bottle labels complete (No., date, signed, pres., etc.)? ..... (YES) NO
11. Did all bottle labels and tags agree with custody papers? ..... (YES) NO
12. Were correct bottles used for the tests indicated? ..... (YES) NO
13. If present, were VOA vials checked for absence of air bubbles and noted if found? ..... (YES) NO
14. Was sufficient amount of sample sent in each bottle? ..... (YES) NO
15. Were correct preservatives used? ..... (YES) NO
16. Corrective action taken, if necessary: ..... YES NO
    a. Name of person contacted _____ Date: _____
    b. See attached MAS CRF for explanation of receipt anomalies Y / N

MultiChem

GC/MS VOLATILES
EPA 8260B

Data Deliverable

ACCESSION: 821878

MultiChem
ANALYTICAL SERVICES

MAS I.D. # 821879
UST - 026

November 30, 1999

URS Greiner/Woodward-Clyde
3501 Denali Street
Suite 101
Anchorage AK 99503

Attention : Scott Kendall

Project Number : 74F0E9408U.00/05700

Project Name : OUB Long Term Groundwater Sampling

Dear Mr. Kendall:

On November 9, 1999, MultiChem Analytical Services received three samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Sincerely,

Gary A. Morelli

Gary A. Morelli
Project Manager

GAM/hal/trm

Enclosure

560 Naches Avenue SW, Suite 101, Renton, Washington 98055-2200 • 425-228-8335 • FAX 425-228-8336 • 1-800-609-0580 • info@multichem.com

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

SAMPLE CROSS REFERENCE SHEET

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

MAS #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
821879-1	99PRDA-125-GW	11/04/99	WATER
821879-2	99PRDA-126-GW	11/04/99	WATER
821879-3	TRIP BLANK	11/04/99	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	3

MAS STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

ANALYTICAL SCHEDULE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

ANALYSIS	TECHNIQUE	REFERENCE	LAB
VOLATILE ORGANICS ANALYSIS	GCMS	EPA 8260B	R

R = MAS - Renton
ANC = MAS - Anchorage
SUB = Subcontract

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The percent recovery of the matrix spiking compound trichloroethene fell below MultiChem's current recovery range in the matrix spike/matrix spike duplicate (MS/MSD) associated with the samples in this accession. These anomalies were attributed to the high concentration of trichloroethene detected in the unspiked sample, and were therefore labeled "G" for reporting purposes, and no further corrective action was performed.

The percent recovery of the matrix spiking compound trichloroethene exceeded the upper limit of the calibration curve in the MS/MSD associated with the samples in this accession. The MS/MSD were not reanalyzed at a dilution, and the affected concentrations have been "C" flagged on the appropriate MS/MSD summary form. No further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/12/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	117	50 - 150
1,2-DICHLOROETHANE-D4	111	81 - 130
TOLUENE-D8	103	80 - 120
BROMOFLUOROBENZENE	100	75 - 118

MAS I.D. # 821879-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/04/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/09/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-125-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	6.5	
VINYL CHLORIDE	3.1	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	68	
1,1-DICHLOROETHENE	13	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	36	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	1.1	
CIS-1,2-DICHLOROETHENE	300	D6
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	970	D6
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	10	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	10	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821879-1

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/04/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/09/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-125-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	100
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	120	50 - 150
1,2-DICHLOROETHANE-D4	120	81 - 130
TOLUENE-D8	100	80 - 120
BROMOFLUOROBENZENE	104	75 - 118

MAS I.D. # 821879-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/04/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/09/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-126-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS	
DICHLORODIFLUOROMETHANE	<1.0	
CHLOROMETHANE	7.6	
VINYL CHLORIDE	2.8	
BROMOMETHANE	<1.0	
CHLOROETHANE	<1.0	
TRICHLOROFLUOROMETHANE	<1.0	
ACETONE	<10	
1,1-DICHLOROETHENE	14	
METHYLENE CHLORIDE	<5.0	
CARBON DISULFIDE	<10	
TRANS-1,2-DICHLOROETHENE	40	
1,1-DICHLOROETHANE	<1.0	
VINYL ACETATE	<10	
2-BUTANONE (MEK)	<10	
CHLOROFORM	<1.0	
CIS-1,2-DICHLOROETHENE	340	D6
BROMOCHLOROMETHANE	<1.0	
2,2-DICHLOROPROPANE	<1.0	
1,1,1-TRICHLOROETHANE	<1.0	
1,2-DICHLOROETHANE	<1.0	
1,1-DICHLOROPROPENE	<1.0	
CARBON TETRACHLORIDE	<1.0	
BENZENE	<1.0	
DIBROMOMETHANE	<1.0	
1,2-DICHLOROPROPANE	<1.0	
TRICHLOROETHENE	970	D6
BROMODICHLOROMETHANE	<1.0	
CIS-1,3-DICHLOROPROPENE	<3.0	
4-METHYL-2-PENTANONE (MIBK)	<10	
TRANS-1,3-DICHLOROPROPENE	<3.0	
1,1,2-TRICHLOROETHANE	8.7	
TOLUENE	<1.0	
1,2-DIBROMOETHANE(EDB)	<1.0	
1,3-DICHLOROPROPANE	<1.0	
CHLORODIBROMOMETHANE	<2.0	
2-HEXANONE	<10	
TETRACHLOROETHENE	9.2	
1,1,1,2-TETRACHLOROETHANE	<1.0	

D6 = Value from a 50 fold diluted analysis.

MAS I.D. # 821879-2

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: 11/04/99
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: 11/09/99
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: 99PRDA-126-GW	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	26
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	122	50 - 150
1,2-DICHLOROETHANE-D4	120	81 - 130
TOLUENE-D8	100	80 - 120
BROMOFLUOROBENZENE	104	75 - 118

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
DICHLORODIFLUOROMETHANE	<1.0
CHLOROMETHANE	<5.0
VINYL CHLORIDE	<1.0
BROMOMETHANE	<1.0
CHLOROETHANE	<1.0
TRICHLOROFLUOROMETHANE	<1.0
ACETONE	<10
1,1-DICHLOROETHENE	<1.0
METHYLENE CHLORIDE	<5.0
CARBON DISULFIDE	<10
TRANS-1,2-DICHLOROETHENE	<1.0
1,1-DICHLOROETHANE	<1.0
VINYL ACETATE	<10
2-BUTANONE (MEK)	<10
CHLOROFORM	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
BROMOCHLOROMETHANE	<1.0
2,2-DICHLOROPROPANE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROPROPENE	<1.0
CARBON TETRACHLORIDE	<1.0
BENZENE	<1.0
DIBROMOMETHANE	<1.0
1,2-DICHLOROPROPANE	<1.0
TRICHLOROETHENE	<1.0
BROMODICHLOROMETHANE	<1.0
CIS-1,3-DICHLOROPROPENE	<3.0
4-METHYL-2-PENTANONE (MIBK)	<10
TRANS-1,3-DICHLOROPROPENE	<3.0
1,1,2-TRICHLOROETHANE	<1.0
TOLUENE	<1.0
1,2-DIBROMOETHANE(EDB)	<1.0
1,3-DICHLOROPROPANE	<1.0
CHLORODIBROMOMETHANE	<2.0
2-HEXANONE	<10
TETRACHLOROETHENE	<1.0
1,1,1,2-TETRACHLOROETHANE	<1.0

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT	: URS GREINER/WOODWARD-CLYDE	DATE SAMPLED	: N/A
PROJECT #	: 74F0E9408U.00/05700	DATE RECEIVED	: N/A
PROJECT NAME	: OUB LONG TERM GROUNDWATER SAMPLING	DATE EXTRACTED	: N/A
CLIENT I.D.	: METHOD BLANK	DATE ANALYZED	: 11/13/99
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8260B	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROBENZENE	<1.0
ETHYLBENZENE	<1.0
BROMOFORM	<3.0
STYRENE	<1.0
TOTAL XYLENES	<1.0
1,1,2,2-TETRACHLOROETHANE	<1.0
1,2,3-TRICHLOROPROPANE	<1.0
ISOPROPYLBENZENE	<1.0
BROMOBENZENE	<1.0
N-PROPYLBENZENE	<1.0
2-CHLOROTOLUENE	<1.0
4-CHLOROTOLUENE	<1.0
1,3,5-TRIMETHYLBENZENE	<1.0
TERT-BUTYLBENZENE	<1.0
1,2,4-TRIMETHYLBENZENE	<1.0
SEC-BUTYLBENZENE	<1.0
1,3-DICHLOROBENZENE	<2.0
1,4-DICHLOROBENZENE	<2.0
P-ISOPROPYLTOLUENE	<2.0
1,2-DICHLOROBENZENE	<2.0
N-BUTYLBENZENE	<1.0
1,2-DIBROMO-3-CHLOROPROPANE	<3.0
1,2,4-TRICHLOROBENZENE	<5.0
NAPHTHALENE	<5.0
HEXACHLOROBUTADIENE	<3.0
1,2,3-TRICHLOROBENZENE	<5.0

SURROGATE PERCENT RECOVERY		LIMITS
DIBROMOFLUOROMETHANE	118	50 - 150
1,2-DICHLOROETHANE-D4	116	81 - 130
TOLUENE-D8	106	80 - 120
BROMOFLUOROBENZENE	100	75 - 118

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/12/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	54.5	109	N/A	N/A	N/A
BENZENE	<1.00	50.0	50.4	101	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	46.7	93	N/A	N/A	N/A
TOLUENE	<1.00	50.0	51.1	102	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	50.7	101	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	119	N/A	50 - 150
1,2-DICHLOROETHANE-D4	108	N/A	81 - 130
TOLUENE-D8	103	N/A	80 - 120
BROMOFLUOROBENZENE	97	N/A	75 - 118

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : BLANK
DATE EXTRACTED : N/A
DATE ANALYZED : 11/13/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	54.7	109	N/A	N/A	N/A
BENZENE	<1.00	50.0	50.1	100	N/A	N/A	N/A
TRICHLOROETHENE	<1.00	50.0	49.0	98	N/A	N/A	N/A
TOLUENE	<1.00	50.0	52.5	105	N/A	N/A	N/A
CHLOROBENZENE	<1.00	50.0	49.2	98	N/A	N/A	N/A

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	67 - 131	20
BENZENE	80 - 120	20
TRICHLOROETHENE	80 - 120	20
TOLUENE	80 - 125	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	121	N/A	50 - 150
1,2-DICHLOROETHANE-D4	113	N/A	81 - 130
TOLUENE-D8	104	N/A	80 - 120
BROMOFLUOROBENZENE	98	N/A	75 - 118

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING
SAMPLE MATRIX : WATER
EPA METHOD : 8260B

SAMPLE I.D. # : 821878-3
DATE EXTRACTED : N/A
DATE ANALYZED : 11/12/99
UNITS : ug/L

COMPOUNDS	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1.00	50.0	57.3	115	56.8	114	1
BENZENE	<1.00	50.0	51.4	103	50.6	101	2
TRICHLOROETHENE	243 D6	50.0	280 C	74G	267 C	48G	5
TOLUENE	<1.00	50.0	51.7	103	51.6	103	0
CHLOROBENZENE	<1.00	50.0	48.3	97	48.6	97	1

CONTROL LIMITS	% REC.	RPD
1,1-DICHLOROETHENE	72 - 137	20
BENZENE	80 - 133	20
TRICHLOROETHENE	79 - 120	20
TOLUENE	72 - 137	20
CHLOROBENZENE	80 - 120	20

SURROGATE RECOVERIES	SPIKE	DUP. SPIKE	LIMITS
DIBROMOFLUOROMETHANE	122	122	50 - 150
1,2-DICHLOROETHANE-D4	121	116	81 - 130
TOLUENE-D8	105	105	80 - 120
BROMOFLUOROBENZENE	108	108	75 - 118

D6 = Value from a 50 fold diluted analysis.
C = Estimated, value above linear range.
G = Out of limits due to high levels of target analytes in sample.

To Renton

MultiChem Analytical Services

2000 W. INTERNATIONAL A/P RD., SUITE C-7
ANCHORAGE, AK 99502
Phone: 907/248-8273 Fax: 907/248-8274

ACCESSION #: 821879

Page: 1 of 1

CHAIN OF CUSTODY

COMPANY: URS GWC
ADDRESS: 3501 DENALI ST, STE 101
Anchorage, AK 99503
PHONE: (907) 561-1020 FAX: (907) 563-3198
REPORT TO: Scott KENDALL
PROJECT NAME: OUB Long Term Groundwater Sampling
PROJECT #: 74F0E94080.00 05700
MAS WILL: (DISPOSE) / RETURN samples (circle one)

SAMPLE ID	DATE	TIME	MATRIX	LAB #
99PRDA-125-GW	11-04-99	1450	WATER	01
99PRDA-126-GW	11-04-99	1600	WATER	02
*Trip blank	↓	—	↓	03

MAS-Alaska Analyses: GRO (8015m); BETX (8021m); GRO/BETX (8015m/8021m); DRO (8100m); DRO-EXTENDED (8100m); AK101 (GRO); AK101/8021m (GRO/BETX); AK102 (DRO); AK103 (RRO); AK102/103 (DRO/RRO)

MAS-WA or Subcontract Analyses: TRPH 418.1; 8260 - GC/MS Volatiles; 8270 - GC/MS Semivolatiles; 8081/8082 - Pest/PC8s; PC8s only (8081/8082); 8021 - Arom/Halog Volatiles; As,Cd,Cr,Pb (Totals); TCLP (8) Metals (1311); RCRA (8) Metals; Metals (list below) *; Total # of Containers

SAMPLE ID	8260 - GC/MS Volatiles	Total # of Containers
99PRDA-125-GW	1	3
99PRDA-126-GW	1	3
*Trip blank	1	3

-HOLD-
DO NOT RUN

Turnaround time (TAT):
STANDARD: ☒ (Winter: 5 WD FAX FUELS, 10 WD OTHER)
RUSH (check one): 24 HR ☐ 48 HR ☐ 72 HR ☐ 1 WK ☐
PURCHASE ORDER #:

Report type :
STANDARD (Level II) ☐
or with Raw Data Pkg.: ADEC ☐ ACOE ☒ CHRO's ☐
Electronic Data Disc (EDD) ☒

Sample Receipt:
TOTAL # CONTAINERS RECEIVED: 9
COOLER SEALS PRESENT ? Y (N)
IF SO, INTACT? N/A Y N
COOLER TEMP: 2.3°C
CONTAINERS REC'D INTACT? (Y) N
RECEIVED VIA: Hand carry

Relinquished by: Kim Grabbe
Signature: Kim Grabbe Date: 11-5-99
Printed name: Kim Grabbe Time: 1300
Company: URS GWC

Received by:
Signature: L Andela Date: 11/5/99
Printed name: Lorraine Andela Time: 1300
Company: MultiChem AK

Relinquished by:
Signature: L Andela Date: 11/8/99
Printed name: Lorraine Andela Time: 0910
Company: MultiChem AK

Received at Laboratory by:
Signature: DeLaney Peterson Date: 11/9/99
Printed name: DELANEY PETERSON Time: 1000
Company: MASR

SPECIAL INSTRUCTIONS:
Preservative: HCl
Potentially Hot samples
*Rec'd Trip blank - not listed - Do not run per Scott Kendall 11/5/99
* Metals needed (see above):

Main Office: 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055 425-228-8335

AK041.01

NON-CONFORMANCES?
Y (N)
(if Y see other side)

MultiChem Analytical Services
SAMPLE LOG-IN CHECKLIST

DATE: 11/9/99
TIME: 1000
INITIALS: TJ

ACCESSION NO. 821879
CLIENT: URSGWC
PROJECT: OUB LT. GW Sampling

Shipping:

Type:
X Cooler
___ Box
___ Other

COC Seals:
X Ship. Cont.
___ On Bottles
___ None

Intact?
(Y) N
Y N

Packing Material:
___ Styrofoam
X Bubble Bags
___ Foam Vial Packs
___ Other

Refrigerant:
X Gel Ice Pack
___ Loose Ice
___ Other
___ None

Frozen?
(Y) N
Y N
Y N

Received Via:
___ Hand Delivery
___ Federal Express
___ Airborne
___ Other:
X Courier
___ UPS
___ Taxi
X Goldstreak

Sample Information:

Samp. #	Bottle #
3	9

Type: Soil ~~Water~~ (Water) Product Other

Soil VOAs (Water VOAs)

0 headspace Y N N
0 headspace (Y) N N
Preserved? (Y) N
Trip blanks? (Y) N

Condition of Samples:
Containers:
Intact? (Bottle/Lid) (Y) N
Correct Type? (Y) N

CA # ___

Waters Preserved? (if needed) Y N N

ID's Match C.O.C. (Y) N N

Temperature: 5.7 C CA NO.
(See corrective action on reverse side for explanation if temperature is outside of the MAS recommended range.)

LAB USE ONLY

SOC/TAT DOES NOT MATCH NOTICE

NEED TESTS VERIFIED BY CLIENT

COMMENTS:

USACE
COOLER RECEIPT FORM

Client: URSGWC Accession #: 821879

Project: OUB LT GW SAMPLING

Cooler received on 11/9/99 and opened on 11/9/99

by DELANEY PETERSON Signature Delaney Peterson

1. Were custody seals on outside of cooler and intact? ..... (YES) NO
   a. If YES, how many and where: 2 ON OUTSIDE
   b. Were signature and date correct? ..... (YES) NO
2. Were custody papers taped to lid inside cooler? ..... (YES) NO
3. Were custody papers properly filled out (ink, signed, etc.)? ..... (YES) NO
4. Did you sign custody papers in the appropriate place? ..... (YES) NO
5. Did you attach shipper's packing slip to this form? ..... YES (NO)
6. What kind of packing material was used? BUBBLE BAGS
7. Was sufficient ice used (if appropriate)? Temp 3.7 °C ..... (YES) NO
8. Were all bottles sealed in separate plastic bags? ..... YES (NO)
9. Did all bottles arrive in good condition (unbroken)? ..... (YES) NO
10. Were all bottle labels complete (No., date, signed, pres., etc.)? ..... (YES) NO
11. Did all bottle labels and tags agree with custody papers? ..... (YES) NO
12. Were correct bottles used for the tests indicated? ..... (YES) NO
13. If present, were VOA vials checked for absence of air bubbles and noted if found? ..... (YES) NO
14. Was sufficient amount of sample sent in each bottle? ..... (YES) NO
15. Were correct preservatives used? ..... (YES) NO
16. Corrective action taken, if necessary: ..... YES (NO)
   a. Name of person contacted _____ Date _____
   b. See attached NAS CRF for explanation of receipt anomalies Y N

MultiChem

GC/MS VOLATILES
EPA 8260B

Data Deliverable

ACCESSION: 821879

MAS I.D. # 821879

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The percent recovery of the matrix spiking compound trichloroethene fell below MultiChem's current recovery range in the matrix spike/matrix spike duplicate (MS/MSD) associated with the samples in this accession. These anomalies were attributed to the high concentration of trichloroethene detected in the unspiked sample, and were therefore labeled "G" for reporting purposes, and no further corrective action was performed.

The percent recovery of the matrix spiking compound trichloroethene exceeded the upper limit of the calibration curve in the MS/MSD associated with the samples in this accession. The MS/MSD were not reanalyzed at a dilution, and the affected concentrations have been "C" flagged on the appropriate MS/MSD summary form. No further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

001

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 10/28/99
Shift: 1st
Analyst: SK

I.S. + S.S.: 530.34.2
I.S.:
SPIKE:
TCLP SPIKE:
GC COLUMN: J & W DB-VRX 75m Capillary Column

Instrument I.D.: HP #4
Tune File: BF1025
Sequence: B1028A

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	05:22	1	MBFB	>B0061		BFB 50ng				
2		1	M8260	62		VSTD001	W	5ml	1	+20µl 376.91.2/50ml H2O
3		2		63		VSTD002				+40µl 530.38.2 /
4		3		64		VSTD005				+4µl /
5		4		65		VSTD010				+50µl /
6		5		66		VSTD020				+10µl 530.38.1 /
7		6		67		VSTD050				+20µl /
8		7		68		~~VSTD100~~ 2nd Source				+50µl /
9		8		69		~~VSTD150~~ VSTD100				+3µl 530.39.1 /
10		9		70		~~#~~ VSTD150				+100µl 530.38.1 /
11	12:34	10		71		VSTD200				+150µl /
12										+200µl /
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

SK 10/28/99

ID File: BI4060, BIWERM
Cal File: BC4060

Reviewed By: ____________

10/8/99

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP84

Contractor: HRS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0068 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC	S
1)	Dichlorodifluoromethane	.31380	.77624	.80632	.84743	.86847	.84283	.80624	.83605	.78813	.84173	5.535		
2)	Chloromethane	.14726	.14505	.15308	.12956	.12519	.12945	.14969	.14205	.13564	.13875	7.220		
3)	Vinyl Chloride	.25895	.21966	.21538	.19082	.18693	.20816	.26060	.26005	.24660	.22746	13.081	*	
4)	Bromomethane	.30345	.33240	.30070	.28801	.28615	.27806	.30436	.29900	.27474	.30299	9.287		
5)	Chloroethane	.12833	.11887	.10166	.09962	.10211	.10033	.10478	.10361	.10159	.10677	9.322		
6)	Trichlorofluoromethane	1.01572	.88122	.89304	.93566	.95808	.93567	.99273	.94396	.89443	.93897	4.854		
7)	Acetone	-	-	-	.18850	.18196	.16458	.17819	.16510	.15203	.17174	7.850		
8)	1,1-Dichloroethene	.27503	.22725	.21223	.20853	.20339	.20222	.21573	.21407	.21218	.21899	10.174	*	
9)	Methylene Chloride	-	-	.25067	.22359	.22618	.21574	.22304	.22191	.21425	.22506	5.373		
10)	Carbon Disulfide	.56298	.53849	.53067	.52040	.49832	.50596	.53522	.53153	.51996	.52706	3.604		
11)	trans-1,2-Dichloroethene	.30316	.26375	.23938	.23839	.23479	.23426	.24336	.23955	.22820	.24720	9.379		
12)	1,1-Dichloroethane	.50527	.53623	.54148	.54933	.55267	.54659	.55946	.55565	.52690	.54151	3.123		
13)	Vinyl Acetate	-	-	.12628	.13269	.11413	.10883	.22105	-	-	.14060	32.690	2nd	
14)	2-Butanone	-	-	-	.13277	.13232	.13071	.14719	.14452	.13965	.13808	4.401		
15)	Chloroform	.80471	.79594	.80520	.83272	.83434	.83089	.85708	.83459	.81157	.82309	2.411	*	
16)	cis-1,2-Dichloroethene	.27704	.26795	.25572	.25640	.25768	.25564	.26463	.26025	.25772	.26145	2.762		
17)	Bromochloromethane	.15583	.21045	.19300	.20260	.19793	.20893	.21602	.21235	.20564	.20031	9.060		
18)	2,2-Dichloropropane	.74585	.68127	.70838	.72205	.74814	.74611	.77912	.75448	.73445	.73563	3.869		
19)	Dibromofluoromethane	.70612	.72112	.72941	.74201	.74405	.76569	.78390	.77477	.76452	.74796	3.494		
20)	1,1,1-Trichloroethane	.80815	.75960	.75925	.80819	.82027	.83445	.87061	.84353	.83320	.81525	4.531		
21)	1,2-Dichloroethane-d4	.67243	.75814	.79443	.82519	.83453	.84520	.84643	.80312	.79507	.79785	6.887		
22)	1,2-Dichloroethane	1.25548	1.00994	.90908	.85050	.82687	.83138	.84459	.79239	.78412	.90710	17.230	2nd	
23)	1,1-Dichloropropene	.53529	.47557	.47304	.45194	.47142	.47177	.49994	.47524	.47038	.48140	4.904		
24)	Carbon Tetrachloride	.58514	.68928	.74515	.76113	.80630	.84456	.89486	.85853	.85090	.78243	12.600		
25)	Benzene	.68107	.61913	.62988	.59252	.60394	.60728	.62159	.61442	.62044	.62114	4.035		
26)	Dibromomethane	.37079	.41127	.40487	.42324	.44608	.45169	.47424	.45608	.45261	.43321	7.037		
27)	1,2-Dichloropropane	.33155	.30209	.27584	.28140	.27965	.27294	.28654	.28249	.28616	.28874	6.260	*	
28)	Trichloroethene	.40574	.39304	.42423	.43191	.43498	.43264	.45784	.43312	.43583	.43437	4.717		
29)	Bromodichloromethane	.84597	.83680	.89742	.92412	.95632	.97872	1.04237	1.01893	.99294	.94373	7.742		
30)	2-Chloroethylvinylether	.11911	.15688	.14420	.16445	.16384	.17496	.18622	.17786	.17135	.16209	12.503		
31)	cis-1,3-Dichloropropene	.42197	.41230	.43313	.45396	.45341	.45465	.50005	.49154	.50410	.45834	7.347		
32)	4-Methyl-2-Pentanone	.26083	.27131	.25648	.30610	.29434	.29675	.32388	.30544	.28954	.28941	7.755		

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAC Renton Calibration Date: 10/20/89

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	Laboratory ID: >B0062 RF 1.00	>B0063 RF 2.00	>B0064 RF 5.00	>B0065 RF 10.00	>B0066 RF 20.00	>B0067 RF 50.00	>B0068 RF 100.00	>B0070 RF 150.00	>B0071 RF 200.00	$\overline{RF}$	% RSD	CCC *
33)	trans-1,3-Dichloropropene	.47762	.47402	.49203	.52168	.52917	.53807	.57632	.54136	.54170	.52143	6.511	
34)	1,1,2-Trichloroethane	.31888	.28317	.26388	.27562	.28246	.27390	.29051	.27997	.27869	.28367	5.561	
35)	Toluene-d8	.93716	.97521	.96810	.96700	.96977	.97486	.99284	.96212	.94716	.96612	1.680	
36)	Toluene	.40892	.45322	.42797	.42720	.42607	.44120	.46590	.44332	.44141	.44393	3.613	*
37)	1,2-Dibromoethane	.52486	.50084	.51760	.54597	.55140	.58128	.61766	.57285	.56192	.55271	6.493	
38)	1,3-Dichloropropane	.93445	.73504	.76570	.75401	.75544	.70930	.69712	.68797	.66242	.74478	10.641	
39)	Chlorodibromomethane	1.03810	1.01900	1.03404	1.10793	1.12522	1.10964	1.09281	1.05238	1.02906	1.07313	3.713	
40)	2-Hexanone	-	-	-	.30871	.40744	.39539	.41270	.38137	.34892	.36909	5.869	
41)	Tetrachloroethene	.81479	.61260	.59958	.58574	.59982	.58212	.57345	.54168	.52560	.60393	13.893	
42)	1,1,1,2-Tetrachloroethane	.73704	.62046	.67312	.70268	.68029	.67233	.64705	.62163	.59961	.66316	6.516	
43)	Chlorobenzene	1.26549	.97402	.95796	.93892	.91425	.90278	.87547	.85200	.83929	.94669	13.524	
44)	Ethylbenzene	1.98802	1.50237	1.49962	1.49165	1.46479	1.44417	1.40578	1.35145	1.33017	1.48067	11.379	*
45)	Bromoform	.82038	.76471	.85120	.91061	.87656	.90067	.90210	.85535	.84355	.85835	5.411	
46)	(m+p)-Xylene	.62413	.48363	.48208	.46220	.47014	.45413	.45128	.43753	.43691	.47080	12.081	
47)	Styrene	.95075	.79019	.75463	.77840	.76731	.76330	.75138	.73868	.74047	.78168	8.390	
48)	o-Xylene	.57362	.47323	.46193	.48637	.46485	.45721	.43923	.44093	.43359	.47011	9.021	
49)	1,1,2,2-Tetrachloroethane	1.16948	.96494	.99543	.99778	.94618	.93342	.93967	.92516	.96860	.98230	7.611	
50)	1,2,3-Trichloropropane	1.03708	.93673	.81130	.89284	.84028	.82557	.82416	.79150	.80912	.86340	9.251	
51)	Bromofluorobenzene	1.84045	1.82174	1.85048	1.80956	1.81165	1.78645	1.74244	1.69168	1.73544	1.78777	2.995	
52)	Isopropylbenzene	2.34253	1.84038	1.76426	1.74023	1.73039	1.72021	1.74084	1.69993	1.73918	1.81087	11.070	
53)	Bromobenzene	.96313	.77588	.74250	.78535	.78175	.77388	.76835	.76067	.78985	.79349	8.216	
54)	n-Propylbenzene	.42640	.33079	.35057	.35132	.35104	.35939	.36427	.36233	.37399	.36423	6.974	
55)	2-Chlorotoluene	.52242	.41317	.42271	.42620	.41796	.40883	.41402	.41412	.42560	.42945	8.236	
56)	4-Chlorotoluene	2.47075	2.20282	2.03070	1.97065	1.93200	1.91640	1.94898	1.91258	1.95141	2.03737	9.120	
57)	1,3,5-Trimethylbenzene	2.03361	1.51245	1.49781	1.54050	1.53261	1.51705	1.53197	1.48374	1.52855	1.57448	10.994	
58)	tert-Butylbenzene	1.68414	1.22543	1.17455	1.21057	1.17063	1.16041	1.17091	1.13997	1.17441	1.23522	13.702	
59)	1,2,4-Trimethylbenzene	2.07715	1.60026	1.48389	1.53951	1.52970	1.49443	1.52667	1.47152	1.49824	1.58015	12.041	
60)	sec-Butylbenzene	2.26790	1.71232	1.57678	1.58327	1.57174	1.56701	1.61405	1.56090	1.61840	1.67481	13.570	
61)	1,3-Dichlorobenzene	-	1.12975	1.04084	1.07739	1.01587	.99316	1.03755	1.01139	1.04116	1.04339	4.125	
62)	1,4-Dichlorobenzene	-	1.27523	1.21360	1.22362	1.13783	1.14591	1.17903	1.13990	1.15991	1.18440	4.140	
63)	p-Isopropyltoluene	-	1.46527	1.29600	1.32744	1.31433	1.31212	1.33044	1.29223	1.31773	1.33194	4.168	
64)	1,2-Dichlorobenzene	-	1.14744	1.06340	1.10174	1.03593	1.03044	1.03839	1.01899	1.04389	1.06003	4.100	

RF - Response Factor (Subscript is amoont in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP44

Contractor: MAS Renton Calibration Date: 10/20/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Laboratory ID: >B0062 >B0063 >B0064 >B0065 >B0066 >B0067 >B0068 >B0070 >B0071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC *
65)	n-Butylbenzene	1.98590	1.27720	1.20574	1.17542	1.11271	1.14925	1.16310	1.10435	1.13533	1.25656	22.161	2nd
66)	1,2-Dibromo-3-Chloropropane	-	.47706	.42397	.45288	.43355	.44760	.45420	.43038	.43583	.44443	3.851	
67)	1,2,4-Trichlorobenzene	-	.78506	.68776	.68796	.64122	.66901	.64634	.63034	.63441	.67283	7.540	
68)	Naphthalene	-	-	1.32413	1.27465	1.17163	1.20822	1.15645	1.15314	1.15701	1.20640	5.612	
69)	Hexachlorobutadiene	-	.53965	.49333	.47758	.44755	.45985	.42405	.39971	.40263	.45554	10.488	
70)	1,2,3-Trichlorobenzene	-	.66809	.55503	.55613	.51296	.52844	.50760	.49319	.49298	.53930	10.076	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAS Renton Calibration Date: 10/20/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
1)	Dichlorodifluoromethane	.998271	.999598	-1.34	1.45		
2)	Chloromethane	.998740	.999191	.124	1.71		**
3)	Vinyl Chloride	.998447	.998510	2.24	2.79	*	
4)	Bromomethane	.998283	.999044	-.715	1.45		
5)	Chloroethane	.999062	.999913	-.139	.405		
6)	Trichlorofluoromethane	.998812	.999682	-.956	1.29		
7)	Acetone	.996206	.999011	-4.01	4.06		
8)	1,1-Dichloroethene	.999089	.999890	.313	.375	*	
9)	Methylene Chloride	.999600	.999831	-.956	.569		
10)	Carbon Disulfide	.999825	.999862	.156	.616		
11)	trans-1,2-Dichloroethene	.999412	.999769	-.695	.765		
12)	1,1-Dichloroethane	.999381	.999768	-.642	.865		**
13)	Vinyl Acetate	.967042	.999652	10.11	-3.49		
14)	2-Butanone	.999358	.999745	.419	3.29		
15)	Chloroform	.999672	.999921	-.407	.703	*	
16)	cis-1,2-Dichloroethene	.999925	.999958	-.0825	.348		
17)	Bromochloromethane	.999660	.999800	-.0290	1.05		
18)	2,2-Dichloropropane	.999634	.999892	-.310	.887		
19)	Dibromofluoromethane	-	-	-	-		
20)	1,1,1-Trichloroethane	.999806	.999918	.0164	.795		
21)	1,2-Dichloroethane-d4	-	-	-	-		
22)	1,2-Dichloroethane	.999502	.999844	-1.45	-.00380		
23)	1,1-Dichloropropene	.999756	.999803	-.0111	.492		
24)	Carbon Tetrachloride	.999773	.999849	.523	1.14		
25)	Benzene	.999971	.999977	.243	.0629		
26)	Dibromomethane	.999777	.999889	.117	.887		
27)	1,2-Dichloropropane	.999923	.999945	.352	.00575	*	
28)	Trichloroethene	.999716	.999786	-.142	.481		
29)	Bromodichloromethane	.999690	.999839	.322	1.21		
30)	2-Chloroethylvinylether	.999229	.999745	.0121	1.65		
31)	cis-1,3-Dichloropropene	.999731	.999841	1.39	.636		
32)	4-Methyl-2-Pentanone	.998628	.999523	-.529	1.70		
33)	trans-1,3-Dichloropropene	.999502	.999730	.0238	.906		
34)	1,1,2-Trichloroethane	.999598	.999734	-.199	.670		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
35)	Toluene-d8	-	-	-	-		
36)	Toluene	.999700	.999821	-.0826	.729	*	
37)	1,2-Dibromoethane	.999118	.999676	-.373	1.34		
38)	1,3-Dichloropropane	.999611	.999951	-1.58	-.103		
39)	Chlorodibromomethane	.999588	.999980	-1.19	.340		
40)	2-Hexanone	.995596	.999270	-4.77	5.12		
41)	Tetrachloroethene	.999204	.999957	-1.97	.191		
42)	1,1,1,2-Tetrachloroethane	.999264	.999998	-1.97	.162		
43)	Chlorobenzene	.999707	.999992	-1.45	-.323		**
44)	Ethylbenzene	.999658	.999979	-1.58	-.172	*	
45)	Bromoform	.999538	.999920	-.956	.512		**
46)	(m+p)-Xylene	.999892	.999964	-1.98	-.654		
47)	Styrene	.999962	.999980	-.586	-.260		
48)	o-Xylene	.999909	.999968	-.981	-.379		
49)	1,1,2,2-Tetrachloroethane	.999626	.999857	.311	-.840		**
50)	1,2,3-Trichloropropane	.999839	.999841	-.691	-.592		
51)	Bromofluorobenzene	-	-	-	-		
52)	Isopropylbenzene	.999894	.999903	-.124	-.351		
53)	Bromobenzene	.999750	.999891	.302	-.509		
54)	n-Propylbenzene	.999811	.999951	.735	-.135		
55)	2-Chlorotoluene	.999832	.999971	.398	-.493		
56)	4-Chlorotoluene	.999923	.999946	-.0349	-.396		
57)	1,3,5-Trimethylbenzene	.999873	.999879	-.168	-.336		
58)	tert-Butylbenzene	.999835	.999861	-.122	-.507		
59)	1,2,4-Trimethylbenzene	.999883	.999803	-.323	-.276		
60)	sec-Butylbenzene	.999761	.999827	.229	-.374		
61)	1,3-Dichlorobenzene	.999802	.999873	.323	-.446		
62)	1,4-Dichlorobenzene	.999882	.999882	-.191	-.257		
63)	p-Isopropyltoluene	.999900	.999902	-.107	-.238		
64)	1,2-Dichlorobenzene	.999887	.999924	-.0668	-.627		
65)	n-Butylbenzene	.999752	.999752	-.488	-.456		
66)	1,2-Dibromo-3-Chloropropane	.999731	.999796	-.572	.157		
67)	1,2,4-Trichlorobenzene	.999890	.999921	-1.00	-.485		
68)	Naphthalene	.999051	.999051	-1.03	-.982		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
69)	Hexachlorobutadiene	.999360	.999650	-2.71	-1.85		
70)	1,2,3-Trichlorobenzene	.999851	.999935	-1.51	-.639		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

MultiChem Analytical Services - Renton, WA

008

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/12/99 | I.S. + S.S.: 530·44·1 | Instrument I.D.: HP #4

I.S.:

Shift: 2nd | SPIKE: 530·42·1 | Tune File: BF1025

TCLP SPIKE:

Analyst: SK | GC COLUMN: J & W DB-VRX 75m Capillary Column | Sequence: B1112B

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	16:41	1	MBFB	B0393		BFB 50ng	W	5ml	1	+20µl 530·12·2/50ml H2O
2		1	M8260	94		VSTD050				+50µl 530·45·1/50ml H2O
3		1		95		VBLK1112B				
4		2		96		+ BS				+20µl 530·42·1/50ml H2O
5		3		97	<2	921878-11 T.B.				ok
6		4		98		-1 99PRDA·115·GW				ok
7		5		99		-2 116				ok
8		6		B0400		-3 117				Re @ 20x 5x
9		7		01		-4 118				20x
10		8		02		-5 119				20x
11		9		03		-6 120				20x
12		10		04		-7 121				20x
13		11		05		-8 122				20x
14		12		06		-9 123				100x
15		13		07		-10 124				100x
16		14		08		-3MS 117				OK Not TCE "G" +17µl 530·42·1 Spiked into vial
17	04:22	15		09		-3MSD 117				
18		16		10		911029-1 Fridge V01				Re @ 1x
19	05:31	17		11		-2 V02				
20										
21						SK				
22						11/13/99				
23										
24										

ID File: BE4060

Cal File: BE4060

Reviewed By:

Continuing Calibration Check
VOC Compounds

Case No:

Calibration Date: 11/12/88

Contractor: WCC Renton

Time: 12:06

Contract No:

Laboratory ID: >B0304

Instrument ID: HP64

Initial Calibration Date: 10/28/88

Minimum $\overline{RF}$ for SPCC is 0.30 (Chloromethane = 0.10)

Maximum % Diff for CCC is 20%

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.84173	.78648	6.56		
Chloromethane	.13975	.12640	9.49		**
Vinyl Chloride	.27740	.24645	8.35	*	
Bromomethane	.30209	.27018	10.83		
Chloroethane	.10677	.12360	15.77		
Trichlorofluoromethane	.93897	1.08057	15.08		
Acetone	.17174	.12568	26.82		
1,1-Dichloroethene	.21896	.23125	5.61	*	
Methylene Chloride	.22506	.26941	19.70		
Carbon Disulfide	.52706	.55041	4.43		
trans-1,2-Dichloroethene	.24720	.25710	4.00		
1,1-Dichloroethane	.54151	.56560	4.45		**
Vinyl Acetate	.14068	.32612	100.47		
2-Butanone	.13886	.12887	7.19		
Chloroform	.02309	.02402	12.33	*	
cis-1,2-Dichloroethene	.26145	.28631	9.51		
Bromochloromethane	.20831	.21834	9.09		
2,2-Dichloropropane	.73563	.80256	9.10		
Dibromofluoromethane	.74296	.89924	20.23		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.93002	14.08		
1,2-Dichloroethane-d4	.79785	.86279	8.14		
1,2-Dichloroethane	.90716	.93304	1.57		
1,1-Dichloropropene	.48148	.48560	.00		
Carbon Tetrachloride	.78243	.87764	12.17		
Benzene	.62114	.61433	1.10		
Dibromomethane	.13321	.17477	9.60		
1,3-Dichloropropane	.28074	.28175	2.42	*	
Trichloroethene	.13437	.13398	.00		
Bromodichloromethane	.84373	1.00347	0.33		
2-Chloroethylvinylether	.16209	.16668	2.83		
cis-1,3-Dichloropropene	.45034	.53581	16.98		
4-Methyl-2-Pentanone	.28041	.26388	0.82		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/12/88

Contractor: HRS Renton Time: 17:00

Contract No: Laboratory ID: >B0394

Instrument ID: HP54 Initial Calibration Date: 10/20/88

Minimum $\overline{RF}$ for CPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	CPCC
trans-1,3-Dichloropropene	.52143	.60717	16.44		
1,1,2-Trichloroethane	.28367	.28422	.19		
Toluene-d8	.96612	.98657	2.12		
Toluene	.44393	.45143	1.69	*	
1,2-Dibromoethane	.55271	.59791	8.18		
1,3-Dichloropropane	.74478	.76030	2.16		
Chlorodibromomethane	1.07313	1.10861	3.31		
2-Hexanone	.30989	.31120	20.02		
Tetrachloroethene	.60393	.59389	1.66		
1,1,1,2-Tetrachloroethane	.66316	.65054	1.90		
Chlorobenzene	.94669	.92537	2.25	**	
Ethylbenzene	1.48867	1.56751	5.30	*	
Bromoform	.85035	.82309	4.04	**	
(m+p)-Xylene	.47888	.50248	5.12		(Conc=100.00)
Styrene	.78168	.81383	4.11		
o-Xylene	.47011	.49589	5.32		
1,1,2,2-Tetrachloroethane	.98238	.99152	.94	**	
1,2,3-Trichloropropane	.86348	.83038	3.82		
Bromofluorobenzene	1.78777	1.68874	5.54		
Isopropylbenzene	1.81687	2.08566	14.79		
Bromobenzene	.79349	.75615	4.71		
n-Propylbenzene	.36423	.43776	20.19		
2-Chlorotoluene	.42945	.46348	7.92		
4-Chlorotoluene	2.03737	2.06701	1.46		
1,3,5-Trimethylbenzene	1.57448	1.86005	18.56		
tert-Butylbenzene	1.23522	1.54630	25.24		
1,2,4-Trimethylbenzene	1.58815	1.84115	16.52		
sec-Butylbenzene	1.67481	2.18975	30.75		
1,3-Dichlorobenzene	1.04339	1.09923	5.35		
1,4-Dichlorobenzene	1.18440	1.21731	2.78		
p-Isopropyltoluene	1.33194	1.80181	35.28		
1,2-Dichlorobenzene	1.06803	1.09896	3.67		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) CPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 11/17/88

Contractor: HSL Renton

Time: 17:06

Contract No:

Laboratory ID: >B0394

Instrument ID: HP#4

Initial Calibration Date: 10/28/88

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25056	1.50674	39.16		
1,2-Dibromo-3-Chloropropane	.44443	.41278	7.12		
1,2,4-Trichlorobenzene	.67283	.70630	4.97		
Naphthalene	1.20643	1.22140	1.24		
Hexachlorobutadiene	.45554	.48281	5.99		
1,2,3-Trichlorobenzene	.53930	.54852	1.71		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (4) SPCC - System Performance Check Compounds (33)

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/13/99 I.S. + S.S.: 530-44.1 Instrument I.D.: HP #4

Shift: 1st I.S.:

SPIKE: 530-42.1 Tune File: BF1025

TCLP SPIKE:

Analyst: SK GC COLUMN: J & W DB-VRX 75m Capillary Column Sequence: B1113A

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	10:37	1	mBFB	>B0415		BFB 50ng	W	5ml	1	+20µl 530-42.2/50ml H2O
2		1	M524.2	16		VSTD050				+50µl 530-45.1/50ml H2O
3		1		17		VBLK1113A				ok
4		2		18		ABS				+20µl 530-42.1/50ml H2O ok
5		3		19		821878-9DL 99PRDA.123 6W		50µl/5ml	100	ok
6		4		20		-10DL 124				Re @ 500X for 1,1,22-TCA
7		5		21		-3DL 117		100µl/5ml	50	ok
8		6		22		-4DL 118				ok
9		7		23		-5DL 119				ok
10		8		24		-6DL 120				ok
11		9		25		-7DL 121				ok
12		10		26		-8DL 122				ok
13		11		27		821879-1DL 123				ok
14		12		28		-2DL 126				ok
15		13		29		-1 125		5ml	1	ok
16	21:26	14		30		-2 126				ok
17		15		31	SK 11/14/99	Blank Check 1				
18		16		32		2				
19		17		33		3				
20		18		34	<2	911029-1 Friday V01				ok
21	01:11	19		35		-2 V02				ok
22						SK				
23						11/13/99				
24										

ID File: BC1020

Cal File: BC1020

Reviewed By: ______________

SK 11/99

Continuing Calibration Check
NSL Compounds

Case No:

Contractor: NSC Renton

Contract No:

Instrument ID: HP14

Calibration Date: 11/12/99

Time: 10:50

Laboratory ID: 990416

Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 (Chloromethane = 0.10)

Maximum % Diff for CCC is 20%

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.84173	.80460	4.41		
Chloromethane	.13975	.13362	4.39		**
Vinyl Chloride	.22740	.22623	.54	*	
Bromomethane	.30290	.28751	5.11		
Chloroethane	.10077	.12302	15.99		
Trichlorofluoromethane	.93907	1.14084	21.50		
Acetone	.17174	.14570	15.11		
1,1-Dichloroethene	.21996	.23107	5.53	*	
Methylene Chloride	.22580	.23948	6.37		
Carbon Disulfide	.52706	.51755	1.80		
trans-1,2-Dichloroethene	.24728	.25754	4.19		
1,1-Dichloroethane	.54151	.58980	8.92		**
Vinyl Acetate	.14809	.35894	208.09		
2-Butanone	.13886	.15032	8.25		
Chloroform	.82309	.94058	14.27	*	
cis-1,2-Dichloroethene	.26145	.28721	9.85		
Bromochloromethane	.20831	.22488	11.92		
2,2-Dichloropropane	.73563	.82197	11.74		
Dibromofluoromethane	.74286	.90031	21.57		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.95958	17.70		
1,2-Dichloroethane-d4	.79285	.93274	16.91		
1,2-Dichloroethane	.90716	.98230	8.61		
1,1-Dichloropropene	.49140	.58464	4.03		
Carbon Tetrachloride	.70243	.93985	19.87		
Benzene	.62114	.63141	1.65		
Dibromomethane	.43321	.49714	14.76		
1,2-Dichloropropane	.28824	.28828	.01	*	
Trichloroethene	.43437	.44480	2.40		
Bromodichloromethane	.94373	1.06161	12.43		
2-Chloroethylvinylether	.16209	.17286	6.65		
cis-1,3-Dichloropropene	.45834	.56055	23.01		
4-Methyl-2-Pentanone	.28941	.28341	2.06		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/13/98

Contractor: MAS Renton Time: 10:50

Contract No: Laboratory ID: 10841C

Instrument ID: HP44 Initial Calibration Date: 10/20/98

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.64200	23.09		
1,1,2-Trichloroethane	.20367	.20930	5.10		
Toluene-d8	.96612	1.03060	6.68		
Toluene	.44393	.46940	5.74	*	
1,2-Dibromoethane	.55271	.62967	13.74		
1,3-Dichloropropane	.74478	.74940	.62		
Chlorodibromomethane	1.07313	1.08857	1.44		
2-Hexanone	.38909	.35025	9.98		
Tetrachloroethene	.60393	.59255	1.88		
1,1,1,2-Tetrachloroethane	.66316	.66124	.29		
Chlorobenzene	.94669	.91770	3.06	*	
Ethylbenzene	1.48967	1.56928	5.35	*	
Bromoform	.85835	.77440	9.77	**	
(m+p)-Xylene	.47080	.49209	3.13		(Conc=100.00)
Styrene	.78160	.88794	3.36		
o-Xylene	.47011	.48985	4.20		
1,1,2,2-Tetrachloroethane	.90238	1.01270	3.00	**	
1,2,3-Trichloropropane	.86340	.84039	2.67		
Bromofluorobenzene	1.78777	1.68852	5.46		
Isopropylbenzene	1.81687	2.08038	14.91		
Bromobenzene	.78949	.74420	6.28		
n-Propylbenzene	.36423	.41510	22.28		
2-Chlorotoluene	.42945	.45753	6.54		
4-Chlorotoluene	2.03737	2.02544	.59		
1,3,5-Trimethylbenzene	1.57448	1.88985	20.01		
tert-Butylbenzene	1.23522	1.55567	25.94		
1,2,4-Trimethylbenzene	1.58815	1.86371	17.34		
sec-Butylbenzene	1.67401	2.18727	30.68		
1,3-Dichlorobenzene	1.04329	1.12603	7.35		
1,4-Dichlorobenzene	1.18440	1.20952	2.12		
p-Isopropyltoluene	1.33194	1.84255	38.34		
1,2-Dichlorobenzene	1.06803	1.10126	4.17		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 11/13/89

Contractor: MRC Renton

Time: 10:58

Contract No:

Laboratory ID: >B043C

Instrument ID: HP64

Initial Calibration Date: 10/20/89

Minimum $\overline{RF}$ for SPCC is 0.30

Maximum % Diff for CCC is 20%

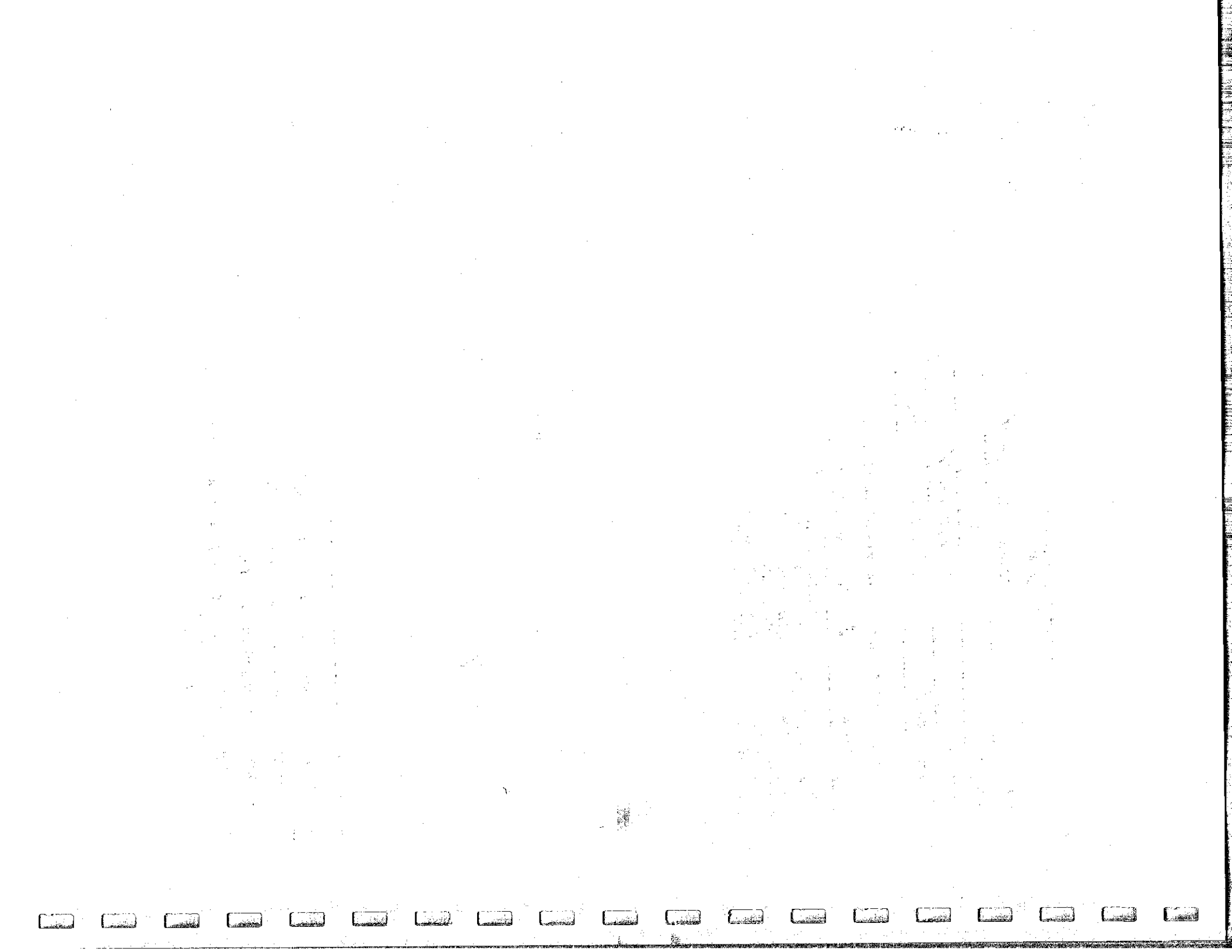
Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25656	1.63506	43.39		
1,2-Dibromo-3-Chloropropane	.44443	.44054	.88		
1,2,4-Trichlorobenzene	.67283	.72056	7.09		
Naphthalene	1.20646	1.19391	1.04		
Hexachlorobutadiene	.45554	.52376	14.98		
1,2,3-Trichlorobenzene	.53030	.56499	4.76		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (4) SPCC - System Performance Check Compounds (4)



MAS I.D. # 821878

MultiChem
ANALYTICAL SERVICES

CASE NARRATIVE

CLIENT : URS GREINER/WOODWARD-CLYDE
PROJECT # : 74F0E9408U.00/05700
PROJECT NAME : OUB LONG TERM GROUNDWATER SAMPLING

CASE NARRATIVE: VOLATILE ORGANICS ANALYSIS

The following anomalies were associated with the preparation and/or analysis of the samples in this accession:

The percent recovery of the matrix spiking compound trichloroethene fell below MultiChem's current recovery range in the matrix spike/matrix spike duplicate (MS/MSD) associated with the samples in this accession. These anomalies were attributed to the high concentration of trichloroethene detected in the unspiked sample, and were therefore labeled "G" for reporting purposes, and no further corrective action was performed.

The percent recovery of the matrix spiking compound trichloroethene exceeded the upper limit of the calibration curve in the MS/MSD associated with the samples in this accession. The MS/MSD were not reanalyzed at a dilution, and the affected concentrations have been "C" flagged on the appropriate MS/MSD summary form. No further corrective action was performed.

All other associated quality assurance/quality control (QA/QC) parameters were within established MultiChem control limits.

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 10/28/99 I.S. + S.S.: 530·34·2 Instrument I.D.: HP #4

Shift: 1st I.S.:

SPIKE: Tune File: BF1025

TCLP SPIKE:

Analyst: SK GC COLUMN: J & W DB-VRX 75m Capillary Column Sequence: B1028A

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	05:22	1	MBFB	>B0061		BFB 50ng	W	5ml	1	+20µl 376·112/50ml H2O
2		1	M8260	62		VSTD001				+10µl 530·38·2 /
3		2		63		VSTD002				+20µl /
4		3		64		VSTD005				+50µl /
5		4		65		VSTD010				+10µl 530·38·1 /
6		5		66		VSTD020				+20µl /
7		6		67		VSTD050				+50µl /
8		7		68		~~VSTD100~~ 2nd Source				+30µl 530·39·1 /
9		8		69		~~VSTD150~~ VSTD100				+100µl 530·38·1 /
10		9		70		~~+~~ VSTD150				+150µl /
11	12:34	10		71		VSTD200				+200µl /
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

SK 10/28/99

ID File: 5IL4060, BIWERM
Cal File: BC4060

Reviewed By: ____________

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: HAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Laboratory ID: >80062 >80063 >80064 >80065 >80066 >80067 >80069 >80070 >80071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC
1)	Dichlorodifluoromethane	.91300	.77624	.80632	.84749	.86847	.84283	.89624	.83605	.78813	.84173	5.535	
2)	Chloromethane	.14720	.14585	.15308	.12956	.12519	.12945	.14969	.14205	.13504	.13975	7.220	
3)	Vinyl Chloride	.25895	.21966	.21538	.19082	.18693	.20816	.26080	.26085	.24660	.22746	13.081	*
4)	Bromomethane	.30345	.33240	.30070	.28801	.28615	.27806	.30436	.29300	.27474	.30299	9.387	
5)	Chloroethane	.12833	.11887	.10166	.09962	.10211	.10033	.10470	.10361	.10150	.10677	9.322	
6)	Trichlorofluoromethane	1.01572	.88122	.89304	.93506	.95808	.93587	.99273	.94396	.89443	.93897	4.854	
7)	Acetone	-	-	-	.18850	.18196	.16458	.17819	.16510	.15209	.17174	7.850	
8)	1,1-Dichloroethene	.27503	.22725	.21223	.20853	.20339	.20222	.21573	.21407	.21218	.21899	10.174	*
9)	Methylene Chloride	-	-	.25067	.22359	.22618	.21574	.22304	.22191	.21425	.22506	5.373	
10)	Carbon Disulfide	.56298	.53849	.53067	.52040	.49832	.50596	.53522	.53153	.51996	.52706	3.604	
11)	trans-1,2-Dichloroethene	.30316	.26375	.23033	.23839	.23479	.23426	.24336	.23955	.22820	.24720	9.379	
12)	1,1-Dichloroethane	.50527	.53023	.54140	.54933	.55267	.54059	.55946	.55565	.52690	.54151	3.123	
13)	Vinyl Acetate	-	-	.12620	.13260	.11413	.10883	.22105	-	-	.14060	32.690	2nd
14)	2-Butanone	-	-	-	.13277	.13232	.13071	.14719	.14452	.13965	.13886	4.401	
15)	Chloroform	.80471	.79594	.80520	.83272	.83434	.83089	.85788	.83459	.81157	.82309	2.411	*
16)	cis-1,2-Dichloroethene	.27704	.26795	.25572	.25640	.25708	.25564	.26463	.26025	.25772	.26145	2.762	
17)	Bromochloromethane	.15589	.21045	.19300	.20260	.19793	.20893	.21602	.21235	.20564	.20031	9.060	
18)	2,2-Dichloropropane	.74585	.68127	.70838	.72285	.74814	.74611	.77812	.75448	.73445	.73563	3.869	
19)	Dibromofluoromethane	.70612	.72112	.72941	.74201	.74405	.76569	.78300	.77477	.76452	.74796	3.494	
20)	1,1,1-Trichloroethane	.80815	.75960	.75925	.80819	.82027	.83445	.87061	.84353	.83320	.81525	4.531	
21)	1,2-Dichloroethane-d4	.67243	.75814	.79449	.82519	.83453	.84520	.84649	.80912	.79507	.79785	6.887	
22)	1,2-Dichloroethane	1.25548	1.06994	.90908	.85056	.82687	.83138	.84459	.79239	.78412	.90710	17.230	2nd
23)	1,1-Dichloropropene	.53529	.47557	.47304	.45194	.47142	.47177	.49994	.47524	.47838	.48140	4.904	
24)	Carbon Tetrachloride	.58514	.68928	.74515	.76113	.80630	.84456	.89486	.85853	.85690	.78243	12.608	
25)	Benzene	.68107	.61913	.62988	.59252	.60394	.60728	.62159	.61442	.62044	.62114	4.835	
26)	Dibromomethane	.37879	.41127	.40467	.42324	.44608	.45169	.47424	.45608	.45261	.43321	7.037	
27)	1,2-Dichloropropane	.33155	.30209	.27584	.28140	.27965	.27294	.28654	.28249	.28616	.28874	6.260	*
28)	Trichloroethene	.40574	.39304	.42423	.43191	.43498	.43264	.45784	.43312	.43583	.43437	4.717	
29)	Bromodichloromethane	.84507	.83680	.89742	.92412	.95632	.97872	1.04237	1.01893	.99294	.94373	7.742	
30)	2-Chloroethylvinylether	.11911	.15080	.14420	.10445	.16384	.17496	.18022	.17786	.17135	.16269	12.503	
31)	cis-1,3-Dichloropropene	.42107	.41230	.43313	.45396	.45341	.45465	.50085	.49154	.50410	.45834	7.347	
32)	4-Methyl-2-Pentanone	.26083	.27131	.25048	.30610	.29434	.29075	.32388	.30544	.28954	.28941	7.755	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (#) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
BSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: HAC Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Laboratory ID: >B0062 >B0063 >B0064 >B0065 >B0066 >B0067 >B0069 >B0070 >B0071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC *
33)	trans-1,3-Dichloropropene	.47762	.47402	.49203	.52166	.52917	.53807	.57632	.54136	.54170	.52143	6.511	
34)	1,1,2-Trichloroethane	.31080	.28317	.26308	.27562	.28246	.27390	.29651	.27997	.27869	.28367	5.561	
35)	Toluene-d8	.93716	.97521	.96910	.96700	.96977	.97466	.99284	.96252	.94716	.96612	1.680	
36)	Toluene	.40892	.45322	.42797	.42720	.42607	.44128	.46598	.44332	.44141	.44393	3.613	*
37)	1,2-Dibromoethane	.52486	.50084	.51760	.54507	.55140	.58128	.61786	.57285	.56192	.55271	6.483	
38)	1,3-Dichloropropane	.93445	.73504	.76570	.75481	.75544	.70930	.69712	.68797	.66242	.74478	10.641	
39)	Chlorodibromomethane	1.08810	1.01900	1.03404	1.10793	1.12522	1.10964	1.09281	1.05238	1.02906	1.07313	3.713	
40)	2-Hexanone	-	-	-	.38871	.40744	.39539	.41270	.38137	.34892	.38909	5.869	
41)	Tetrachloroethene	.81479	.61260	.59058	.58574	.59082	.58212	.57345	.54168	.52568	.60393	13.893	
42)	1,1,1,2-Tetrachloroethane	.73704	.62846	.67312	.70268	.68629	.67233	.64705	.62163	.59981	.66316	6.516	
43)	Chlorobenzene	1.26540	.97402	.95796	.93892	.91425	.90278	.87547	.85208	.83920	.94669	13.524	
44)	Ethylbenzene	1.90802	1.50237	1.49962	1.49165	1.46479	1.44417	1.40578	1.35145	1.33017	1.48867	11.378	*
45)	Bromoform	.82038	.76471	.85120	.91061	.87656	.90067	.90210	.85535	.84355	.85835	5.411	
46)	(m+p)-Xylene	.62413	.48363	.48208	.46220	.47014	.45413	.45128	.43752	.43691	.47000	12.001	
47)	Styrene	.95075	.79019	.75463	.77840	.76731	.76330	.75138	.73868	.74047	.78168	8.390	
48)	o-Xylene	.57362	.47323	.46193	.48637	.46485	.45721	.43923	.44093	.43359	.47011	9.021	
49)	1,1,2,2-Tetrachloroethane	1.16040	.96494	.99543	.99778	.94618	.93342	.93067	.92516	.96860	.98230	7.611	
50)	1,2,3-Trichloropropane	1.03708	.93873	.81130	.89284	.84028	.82557	.82416	.79150	.80912	.86340	9.251	
51)	Bromofluorobenzene	1.84045	1.82174	1.85048	1.80956	1.81165	1.78645	1.74244	1.69168	1.73544	1.78777	2.995	
52)	Isopropylbenzene	2.34253	1.84030	1.76420	1.74023	1.73639	1.72621	1.74084	1.69993	1.73910	1.81007	11.078	
53)	Bromobenzene	.96313	.77588	.74250	.78535	.78175	.77388	.76835	.76067	.78985	.79349	8.216	
54)	n-Propylbenzene	.42640	.33879	.35057	.35132	.35104	.35939	.36427	.36233	.37399	.36423	6.974	
55)	2-Chlorotoluene	.52242	.41317	.42271	.42620	.41796	.40883	.41402	.41412	.42560	.42345	8.236	
56)	4-Chlorotoluene	2.47075	2.20282	2.03070	1.97865	1.93200	1.91640	1.94898	1.91258	1.95141	2.03737	9.120	
57)	1,3,5-Trimethylbenzene	2.03361	1.51245	1.49781	1.54050	1.53261	1.51705	1.53197	1.48374	1.52055	1.57448	10.994	
58)	tert-Butylbenzene	1.68414	1.22543	1.17455	1.21057	1.17063	1.16041	1.17691	1.13997	1.17441	1.23522	13.782	
59)	1,2,4-Trimethylbenzene	2.07715	1.60026	1.48389	1.53951	1.52970	1.49443	1.52667	1.47152	1.49824	1.58015	12.041	
60)	sec-Butylbenzene	2.26790	1.71232	1.57670	1.58327	1.57174	1.56701	1.61405	1.56090	1.61840	1.67401	13.570	
61)	1,3-Dichlorobenzene	-	1.12975	1.04084	1.07739	1.01587	.99316	1.03755	1.01138	1.04116	1.04339	4.125	
62)	1,4-Dichlorobenzene	-	1.27523	1.21368	1.22362	1.13783	1.14591	1.17903	1.13990	1.15991	1.18440	4.140	
63)	p-Isopropyltoluene	-	1.46527	1.29600	1.32744	1.31433	1.31212	1.33044	1.29223	1.31773	1.33194	4.168	
64)	1,2-Dichlorobenzene	-	1.14744	1.06340	1.10174	1.03593	1.03044	1.03839	1.01899	1.04389	1.06003	4.100	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/26/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Laboratory ID: >B0062 >B0063 >B0064 >B0065 >B0066 >B0067 >B0069 >B0070 >B0071

Comp No.	Compound	RF 1.00	RF 2.00	RF 5.00	RF 10.00	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RF}$	% RSD	CCC
65)	n-Butylbenzene	1.98590	1.27720	1.20574	1.17542	1.11271	1.14925	1.16310	1.10435	1.13533	1.25656	22.161	2nd
66)	1,2-Dibromo-3-Chloropropane	-	.47706	.42397	.45200	.43355	.44760	.45420	.43030	.42583	.44443	3.851	
67)	1,2,4-Trichlorobenzene	-	.78506	.68776	.68796	.64122	.66901	.64694	.63034	.63441	.67283	7.540	
68)	Naphthalene	-	-	1.32413	1.27465	1.17163	1.20822	1.15045	1.15314	1.15701	1.20646	5.612	
69)	Hexachlorobutadiene	-	.53965	.49333	.47758	.44755	.45985	.42405	.39971	.40263	.45554	10.480	
70)	1,2,3-Trichlorobenzene	-	.66889	.55503	.55613	.51296	.52044	.50760	.49319	.49298	.53930	10.676	

RF - Response Factor (Subscript is amount in ug/L)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP14

Contractor: MAS Renton Calibration Date: 10/20/89

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
1)	Dichlorodifluoromethane	.998271	.999590	-1.34	1.45		
2)	Chloromethane	.998740	.999191	.124	1.71		**
3)	Vinyl Chloride	.998447	.998510	2.24	2.79	*	
4)	Bromomethane	.998283	.999044	-.715	1.45		
5)	Chloroethane	.999862	.999913	-.139	.405		
6)	Trichlorofluoromethane	.998812	.999682	-.956	1.29		
7)	Acetone	.996286	.999011	-4.81	4.86		
8)	1,1-Dichloroethene	.999889	.999890	.313	.375	*	
9)	Methylene Chloride	.999668	.999831	-.956	.569		
10)	Carbon Disulfide	.999825	.999862	.156	.616		
11)	trans-1,2-Dichloroethene	.999412	.999769	-.695	.765		
12)	1,1-Dichloroethane	.999381	.999768	-.642	.865		**
13)	Vinyl Acetate	.967842	.999652	10.11	-3.49		
14)	2-Butanone	.999358	.999745	.419	3.29		
15)	Chloroform	.999672	.999921	-.407	.703	*	
16)	cis-1,2-Dichloroethene	.999925	.999958	-.0825	.348		
17)	Bromochloromethane	.999660	.999880	-.0290	1.05		
18)	2,2-Dichloropropane	.999634	.999892	-.310	.887		
19)	Dibromofluoromethane	-	-	-	-		
20)	1,1,1-Trichloroethane	.999806	.999918	.0164	.795		
21)	1,2-Dichloroethane-d4	-	-	-	-		
22)	1,2-Dichloroethane	.999502	.999844	-1.45	-.00380		
23)	1,1-Dichloropropene	.999756	.999803	-.0111	.492		
24)	Carbon Tetrachloride	.999773	.999849	.523	1.14		
25)	Benzene	.999971	.999977	.243	.8629		
26)	Dibromomethane	.999777	.999880	.117	.887		
27)	1,2-Dichloropropane	.999923	.999945	.352	.00575	*	
28)	Trichloroethene	.999716	.999786	-.142	.481		
29)	Bromodichloromethane	.999690	.999839	.322	1.21		
30)	2-Chloroethylvinylether	.999229	.999745	.0121	1.65		
31)	cis-1,3-Dichloropropene	.999731	.999841	1.39	.636		
32)	4-Methyl-2-Pentanone	.998628	.999523	-.529	1.70		
33)	trans-1,3-Dichloropropene	.999582	.999730	.0238	.906		
34)	1,1,2-Trichloroethane	.999598	.999734	-.109	.670		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4

Contractor: MAS Renton Calibration Date: 10/28/99

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
35)	Toluene-d8	-	-	-	-		
36)	Toluene	.999700	.999821	-.0826	.729	*	
37)	1,2-Dibromoethane	.999118	.999676	-.373	1.34		
38)	1,3-Dichloropropane	.999611	.999951	-1.58	-.103		
39)	Chlorodibromomethane	.999588	.999980	-1.19	.340		
40)	2-Hexanone	.995596	.999270	-4.77	5.12		
41)	Tetrachloroethene	.999204	.999957	-1.97	.191		
42)	1,1,1,2-Tetrachloroethane	.999264	.999998	-1.97	.162		
43)	Chlorobenzene	.999787	.999992	-1.45	-.323		**
44)	Ethylbenzene	.999658	.999979	-1.58	-.172	*	
45)	Bromoform	.999530	.999920	-.956	.512		**
46)	(m+p)-Xylene	.999892	.999964	-1.98	-.654		
47)	Styrene	.999962	.999980	-.506	-.260		
48)	o-Xylene	.999909	.999968	-.981	-.379		
49)	1,1,2,2-Tetrachloroethane	.999626	.999857	.311	-.840		**
50)	1,2,3-Trichloropropane	.999839	.999841	-.691	-.592		
51)	Bromofluorobenzene	-	-	-	-		
52)	Isopropylbenzene	.999894	.999903	-.124	-.351		
53)	Bromobenzene	.999750	.999891	.302	-.589		
54)	n-Propylbenzene	.999811	.999951	.735	-.135		
55)	2-Chlorotoluene	.999832	.999971	.398	-.493		
56)	4-Chlorotoluene	.999923	.999946	-.0349	-.396		
57)	1,3,5-Trimethylbenzene	.999873	.999979	-.160	-.336		
58)	tert-Butylbenzene	.999835	.999861	-.122	-.507		
59)	1,2,4-Trimethylbenzene	.999803	.999803	-.323	-.276		
60)	sec-Butylbenzene	.999761	.999827	.229	-.374		
61)	1,3-Dichlorobenzene	.999802	.999873	.323	-.446		
62)	1,4-Dichlorobenzene	.999882	.999882	-.191	-.257		
63)	p-Isopropyltoluene	.999900	.999902	-.107	-.238		
64)	1,2-Dichlorobenzene	.999887	.999924	-.0668	-.627		
65)	n-Butylbenzene	.999752	.999752	-.488	-.456		
66)	1,2-Dibromo-3-Chloropropane	.999731	.999796	-.572	.152		
67)	1,2,4-Trichlorobenzene	.999890	.999921	-1.00	-.485		
68)	Naphthalene	.999951	.999951	-1.03	-.982		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No: _____ Instrument ID: HP#4 _____

Contractor: MAS Renton _____ Calibration Date: 10/28/99 _____

Contract No: _____

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % RSD for CCC is 30%

Comp No.	Compound	CORR1	CORR2	Yint1	Yint2	CCC	SPCC
69)	Hexachlorobutadiene	.999360	.999650	-2.71	-1.05		
70)	1,2,3-Trichlorobenzene	.999851	.999935	-1.51	-.639		

CORRn - Coefficient of Correlation (nth degree)

Yintn - Y intercept (nth degree) in ug/L

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

008

MultiChem Analytical Services - Renton, WA

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/2/99 | I.S. + S.S.: 530·44·1 | Instrument I.D.: HP #4

Shift: 2nd | I.S.: | Tune File: BF1025

Analyst: GK | SPIKE: 530·42·1 | Sequence: B1112B

TCLP SPIKE:

GC COLUMN: J & W DB-VRX 75m Capillary Column

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	16:41	1	MBFB	B0393		BFB 50ng	W	5ml	1	+20µl 530·12·2/5ml H_2O
2		1	MBLANC	94		VSTD050				+50µl 530·45·1/5ml H_2O
3		1		95		VBLK1112B				
4		2		96		" BBS				+20µl 530·42·1/5ml H_2O
5		3		97	<7	82878-11 T.B.				MC
6		4		98		-1 99PRDA·115·GW				MC
7		5		" 99		-2 116				MC
8		6		>130400		-3 117				Re @ 20x 50x
9		7		01		-4 118				20x
10		8		02		-5 119				20x
11		9		03		-6 120				20x
12		10		04		-7 121				20x
13		11		05		-8 122				20x
14		12		06		-9 123				100x
15		13		07		-10 124				100x
16		14		08		-3MS 117				MC Not TCE "G" +17µl 530·42·1 Spiked into this vial
17	04:22	15		09		-3MSD 117			1	
18		16		10		91109-1 Fridge VOA				Re @ 1x
19	05:31	17		11		" -2 " VOA				"
20										
21						MC				
22						11/3/99				
23										
24										

ID File: B4060

Cal File: BC4060

Reviewed By: _____

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/12/99

Contractor: HSC Reston Time: 17:00

Contract No: Laboratory ID: >R0394

Instrument ID: GM44 Initial Calibration Date: 10/28/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Chloromethane = 0.10

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.84173	.78640	6.56		
Chloromethane	.13975	.12649	9.49	*	**
Vinyl Chloride	.22746	.24645	8.35	*	
Bromomethane	.30289	.27018	10.83		
Chloroethane	.10677	.12369	15.77		
Trichlorofluoromethane	.93897	1.08857	15.98		
Acetone	.17174	.12568	26.82		
1,1-Dichloroethene	.21886	.23125	5.61	*	
Methylene Chloride	.22586	.24941	10.39		
Carbon Disulfide	.52786	.55041	4.13		
trans-1,2-Dichloroethene	.24720	.25710	4.03		
1,1-Dichloroethane	.54151	.56560	4.45		**
Vinyl Acetate	.14000	.32612	388.67		
2-Butanone	.13086	.12887	7.19		
Chloroform	.82388	.92462	12.33	*	
cis-1,2-Dichloroethene	.26145	.28631	9.51		
Bromochloromethane	.20831	.21834	9.09		
2,2-Dichloropropane	.23563	.30256	9.10		
Dibromofluoromethane	.74796	.89924	20.23		(Conc=50.00)
1,1,1-Trichloroethane	.31525	.33882	14.08		
1,2-Dichloroethane-d4	.79785	.86279	8.14		
1,2-Dichloroethane	1.00716	.83304	1.57		
1,1-Dichloropropene	.48149	.48586	.00		
Carbon Tetrachloride	.70213	.87764	12.17		
Benzene	.62116	.61433	1.10		
Dibromomethane	.13321	.17477	9.68		
1,2-Dichloropropane	.28074	.28175	2.42	*	
Trichloroethene	.13137	.13398	.00		
Bromodichloromethane	.94373	1.00347	0.33		
2-Chloroethylvinylether	.16288	.16668	2.83		
cis-1,3-Dichloropropene	.45034	.53581	19.98		
4-Methyl-2-Pentanone	.28041	.26388	8.92		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: ..... Calibration Date: 11/12/89

Contractor: HRS Renton ..... Time: 17:00

Contract No: ..... Laboratory ID: >00304

Instrument ID: HP#4 ..... Initial Calibration Date: 10/29/89

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.60717	16.44		
1,1,2-Trichloroethane	.28367	.28422	.19		
Toluene-d8	.96612	.98657	2.12		
Toluene	.44393	.45143	1.69	*	
1,2-Dibromoethane	.55271	.59781	8.16		
1,3-Dichloropropane	.74478	.76030	2.16		
Chlorodibromomethane	1.07313	1.10861	3.31		
2-Hexanone	.30909	.31120	20.02		
Tetrachloroethene	.58393	.59389	1.66		
1,1,1,2-Tetrachloroethane	.66316	.65054	1.90		
Chlorobenzene	.94669	.92537	2.25	**	
Ethylbenzene	1.48867	1.56751	5.30	*	
Bromoform	.85835	.82369	4.04	**	
(m+p)-Xylene	.42800	.50240	5.12		(Conc=100.00)
Styrene	.70160	.81383	4.11		
o-Xylene	.47811	.49589	5.32		
1,1,2,2-Tetrachloroethane	.98239	.99157	.94	**	
1,2,3-Trichloropropane	.86348	.83038	3.82		
Bromofluorobenzene	1.78777	1.68874	5.54		
Isopropylbenzene	1.81687	2.08566	14.79		
Bromobenzene	.79349	.75815	4.71		
n-Propylbenzene	.36423	.43776	20.19		
2-Chlorotoluene	.42945	.46348	7.92		
4-Chlorotoluene	2.03737	2.06781	1.46		
1,3,5-Trimethylbenzene	1.57448	1.86665	18.56		
tert-Butylbenzene	1.23522	1.54638	25.24		
1,2,4-Trimethylbenzene	1.58815	1.84115	16.52		
sec-Butylbenzene	1.67481	2.18975	30.75		
1,3-Dichlorobenzene	1.04339	1.09923	5.35		
1,4-Dichlorobenzene	1.10448	1.21731	2.78		
p-Isopropyltoluene	1.33194	1.80191	35.28		
1,2-Dichlorobenzene	1.06803	1.09896	3.67		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: | Calibration Date: 11/12/99

Contractor: HSG Renton | Time: 17:06

Contract No: | Laboratory ID: >B0304

Instrument ID: HP14 | Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 | Maximum % Diff for CCC is 20%

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
n-Butylbenzene	1.25656	1.58674	39.16		
1,2-Dibromo-3-Chloropropane	.44443	.41270	7.12		
1,2,4-Trichlorobenzene	.67283	.70630	4.97		
Naphthalene	1.20646	1.22140	1.24		
Hexachlorobutadiene	.45554	.48281	5.99		
1,2,3-Trichlorobenzene	.53030	.54052	1.71		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (4) SPCC - System Performance Check Compounds (44)

GC/MS Volatile Organic Analysis Benchsheet

Analyst: JH

I.S. + S.S.: 530-44.1

I.S.:

SPIKE: 530-42.1

TCLP SPIKE:

GC COLUMN: J & W DB-VRX 75m Capillary Column

Instrument I.D.: HP #4

Tune File: BF1025

Sequence: B1113A

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID		Matrix	Injection Volume	Dilution Factor	Comments	
1	10:37	1	mBIB	>B0415		BFB 50ng						
2		1	MS260X	16		VSTD050						
3		1		17		VBLK1113A		W	5ml	1	+20ul 530-42.2/50ml H2O	
4		2		18		ABS					+50ul 530-45.1/50ml H2O	
5		3		19		821878-9DL	99PRDA-123 6W					
6		4		20		-10DL	124		50ul/5ml	100	+20ul 530-42.1/50ml H2O	OK
7		5		21		-3DL	117					OK
8		6		22		-4DL	118		100ul/5ml	50	Re @ 500x for 1,1,22-TCP	OK
9		7		23		-5DL	119					OK
10		8		24		-6DL	120					OK
11		9		25		-7DL	121					OK
12		10		26		-8DL	122					OK
13		11		27		821879-1DL	123					OK
14		12		28		-2DL	126					OK
15		13		29		-1	125					OK
16	21:26	14		30		-2	126					OK
17		15		31		Blank Check 1			5ml	1		OK
18		16		32		2						OK
19		17		33		3						OK
20		18		34		911029-1						OK
21	01:11	19		35		-2	Friday V01					OK
22							V02					
23												
24												

JH 11/13/98

OK

OK

ID File: BC4000

Cal File: BC4000

Reviewed By:

JH 11/99

Calibration Check
Compounds

Calibration Date: 11/13/99

Time: 10:50

Laboratory ID: >D0416

ID: MP84

Initial Calibration Date: 10/20/99

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Chloromethane=0.10

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.84173	.80460	4.41		
Chloromethane	.13975	.13362	4.39	*	
Vinyl Chloride	.22746	.22623	.54	*	
Bromomethane	.30299	.28751	5.11		
Chloroethane	.10077	.12382	15.99		
Trichlorofluoromethane	.93897	1.14084	21.50		
Acetone	.17174	.14570	15.11		
1,1-Dichloroethene	.21896	.23107	5.53	*	
Methylene Chloride	.22500	.22940	0.37		
Carbon Disulfide	.52706	.51755	1.80		
trans-1,2-Dichloroethene	.24728	.25754	4.15		
1,1-Dichloroethane	.54151	.58980	8.92	**	
Vinyl Acetate	.14000	.35004	200.00		
2-Butanone	.13896	.15032	8.25		
Chloroform	.82309	.94058	14.27	*	
cis-1,2-Dichloroethene	.26145	.28721	9.85		
Bromochloromethane	.20031	.22400	11.92		
2,2-Dichloropropane	.73563	.82157	11.74		
Dibromofluoromethane	.74796	.90031	21.57		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.95958	17.70		
1,2-Dichloroethane-d4	.70785	.83274	16.91		
1,2-Dichloroethane	.90716	.98230	8.61		
1,1-Dichloropropene	.48140	.50464	4.83		
Carbon Tetrachloride	.78243	.93885	19.97		
Benzene	.62114	.63141	1.65		
Dibromomethane	.43321	.49714	14.76	*	
1,2-Dichloropropane	.28074	.28070	.01	*	
Trichloroethene	.43437	.44180	2.46		
Bromodichloromethane	.84373	1.06101	12.43		
2-Chloroethylvinylether	.16209	.17206	6.65		
cis-1,3-Dichloropropene	.45034	.56055	23.01		
4-Methyl-2-Pentanone	.28941	.28341	2.06		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSC Compounds

Case No: ---------- Calibration Date: 11/13/89

Contractor: HRS Renton ---------- Time: 10:50

Contract No: ---------- Laboratory ID: >00416

Instrument ID: HP#4 ---------- Initial Calibration Date: 10/20/89

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
trans-1,3-Dichloropropene	.52143	.64288	23.29		
1,1,2-Trichloroethane	.28367	.29838	5.19		
Toluene-d8	.98612	1.03068	6.08		
Toluene	.44393	.46940	5.74	*	
1,2-Dibromoethane	.55271	.62967	13.74		
1,3-Dichloropropane	.74470	.74940	.62		
Chlorodibromomethane	1.07313	1.08857	1.44		
2-Hexanone	.38900	.35025	9.98		
Tetrachloroethene	.60393	.59255	1.88		
1,1,1,2-Tetrachloroethane	.66316	.66124	.29		
Chlorobenzene	.94669	.91770	3.06	**	
Ethylbenzene	1.48867	1.56828	5.35	*	
Bromoform	.85835	.77440	9.77	**	
(m+p)-Xylene	.42900	.49209	3.13		(Conc=100.00)
Styrene	.70168	.68784	3.36		
o-Xylene	.42811	.48985	4.28		
1,1,2,2-Tetrachloroethane	.98238	1.01270	3.09	**	
1,2,3-Trichloropropane	.86340	.84039	2.67		
Bromofluorobenzene	1.78777	1.68852	5.44		
Isopropylbenzene	1.81687	2.08838	14.94		
Bromobenzene	.78348	.74426	0.28		
n-Propylbenzene	.36423	.44510	22.28		
2-Chlorotoluene	.42945	.45753	6.54		
4-Chlorotoluene	2.03737	2.02544	.59		
1,3,5-Trimethylbenzene	1.57448	1.09885	30.01		
tert-Butylbenzene	1.23522	1.55567	25.94		
1,2,4-Trimethylbenzene	1.58015	1.86371	17.94		
sec-Butylbenzene	1.67181	2.18727	30.68		
1,3-Dichlorobenzene	1.04330	1.17883	7.35		
1,4-Dichlorobenzene	1.18440	1.20952	2.12		
p-Isopropyltoluene	1.33194	1.84255	38.34		
1,2-Dichlorobenzene	1.06083	1.10426	4.17		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: | Calibration Date: 11/13/89

Contractor: MRC Renton | Time: 18:50

Contract No: | Laboratory ID: >D841C

Instrument ID: HP14 | Initial Calibration Date: 10/29/89

Minimum $\overline{RF}$ for SPCC is 0.30 | Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25050	1.63500	43.39		
1,2-Dibromo-3-Chloropropane	.44443	.44054	.88		
1,2,4-Trichlorobenzene	.67283	.72050	7.09		
Naphthalene	1.20646	1.19391	1.04		
Hexachlorobutadiene	.45554	.52320	14.98		
1,2,3-Trichlorobenzene	.53030	.56490	4.76		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

MultiChem Analytical Services - Renton, WA

016

GC/MS Volatile Organic Analysis Benchsheet

Date: 11/16/99
Shift: 1st
Analyst: SK

I.S. + S.S.: 530.46.1
I.S.:
SPIKE: 530.42.1
TCLP SPIKE:
GC COLUMN: J & W DB-VRX 75m Capillary Column

Instrument I.D.: HP #4
Tune File: BF102
Sequence: B111601

	Time	Pos	GC Prog.	File Name	pH Check	Sample ID	Matrix	Injection Volume	Dilution Factor	Comments
1	05:59	1	MBFB	>B01475		BFB 50ng	W	5ml	1	+20µl 530.45.2/50ml H2O
2		1	MBLOC	76		VBLK111601				+20µl 530.45.1/50ml H2O
3		1		77		VBLK111601				
4		2		78		↓ ABS				
5		3		79	5.2	911012-1 TCLTK-33-11/99				+20µl 530.42.1/50ml H2O
6		4		80		-2 23				
7		5		81		-3 25				
8		6		82		-4 28				
9		7		83		911018-1 14				
10		8		84		911012-1MS 33				
11		9		85		↓ -1MSD 33				+17µl 530.42.1 Spiked into VBA VBAL
12	1410	10	↓	86		821878-10DL MPDA-124-6W	↓	1ml/5ml	500	1:5 of 1:100 ext. dil.
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

11/16/99

ID File: BI4080
Cal File: BCH080

Reviewed By:

Continuing Calibration Check
HSL Compounds

Case No: _____ Calibration Date: 11/16/88

Contractor: HSL Boston Time: 0010

Contract No: _____ Laboratory No: 100476

Instrument ID: HP59 Initial Calibration Date: 10/20/88

Minimum $\overline{RF}$ for CCC is 0.30 / chloromethane = 0.10 Maximum % D for CCC is 20%

Compound	RF	$\overline{RF}$	%Diff	CCC	SPCC
Dichlorodifluoromethane	.04173	.03462	24.61		
Chloromethane	.13075	.13894	6.31		**
Vinyl Chloride	.22746	.22458	1.27	*	
Bromomethane	.30299	.25289	16.80		
Chloroethane	.10677	.12872	20.61		
Trichlorofluoromethane	.03897	.05103	9.05		
Acetone	.17174	.06774	60.56		
1,1-Dichloroethene	.21806	.22302	2.22	*	
Methylene Chloride	.22586	.24172	7.43		
Carbon Disulfide	.52796	.54041	1.05		
trans 1,2-Dichloroethene	.24729	.25302	2.35		
1,1-Dichloroethane	.54151	.53792	.83		**
Vinyl Acetate	.14969	.25715	121.15		
2-Butanone	.13886	.09308	29.59		
Chloroform	.02309	.20545	4.57	*	
cis-1,2-Dichloroethene	.26145	.27412	4.82		
Bromochloromethane	.20831	.20847	4.87		
2,2-Dichloropropane	.23583	.08604	6.82		
Dibromofluoromethane	.24796	.02331	10.97		(Conc=50.00)
1,1,1-Trichloroethane	.81525	.75803	7.00		
1,2-Dichloroethane-d4	.29705	.25805	4.76		
1,2-Dichloroethane	.09718	.09131	10.32		
1,1-Dichloropropene	.40240	.44720	7.00		
Carbon Tetrachloride	.28243	.28052	3.32		
Benzene	.62114	.61470	1.02		
Dibromomethane	.13321	.12336	2.27		
1,2-Dichloropropane	.20824	.20157	2.49	*	
Trichloroethene	.13137	.20130	9.28		
Bromodichloromethane	.24773	.25124	9.00		
2-Chloroethylvinylether	.16209	.14754	8.97		
cis-1,3-Dichloropropene	.45034	.51522	12.42		
4-Methyl 2-Pentanone	.20941	.20423	8.70		

RF - Response Factor from daily standard file at 50.00 ug/L

$\overline{RF}$ - Average Response Factor from Initial Calibration Form 9I

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: Calibration Date: 11/16/89

Contractor: HSL Denton Time: 06:10

Contract No: Laboratory ID: 200426

Instrument ID: HP14 Initial Calibration Date: 10/20/89

Minimum $\overline{RF}$ for CPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	RF	$\overline{RF}$	%Diff	CCC	CPCC
trans-1,3-Dichloropropene	.52142	.50755	2.65		
1,1,2-Trichloroethane	.28367	.27410	3.34		
Toluene-d8	.96612	1.01025	4.62		
Toluene	.11303	.11384	.82	*	
1,2-Dibromoethane	.55271	.56397	2.04		
1,3-Dichloropropane	.74478	.78880	5.91		
Chlorodibromomethane	1.07313	1.03614	3.45		
2-Hexanone	.30900	.31027	20.26		
Tetrachloroethene	.60303	.61023	1.13		
1,1,1,2-Tetrachloroethane	.33316	.34232	3.14		
Chlorobenzene	.94000	.96111	1.59	**	
Ethylbenzene	1.48867	1.56581	5.18	*	
Bromoform	.85035	.79272	8.23	**	
(m+p)-Xylene	.47000	.51923	9.53		(Conc=100.00)
Styrene	.78160	.85307	9.21		
o-Xylene	.47011	.51315	9.16		
1,1,2,2-Tetrachloroethane	.99230	1.01055	3.69	**	
1,2,3-Trichloropropane	.86310	.83353	3.46		
Bromofluorobenzene	1.29277	1.29210	1.16		
Isopropylbenzene	1.81697	1.94345	8.97		
Bromobenzene	.79349	.76319	3.83		
n-Propylbenzene	.36423	.42635	17.06		
2-Chlorotoluene	.42945	.44158	2.82		
4-Chlorotoluene	2.03737	1.96335	3.63		
1,3,5-Trimethylbenzene	1.57440	1.71926	9.19		
tert-Butylbenzene	1.23522	1.36709	10.71		
1,2,4-Trimethylbenzene	1.58915	1.72249	8.38		
sec-Butylbenzene	1.67491	1.92216	14.77		
1,3-Dichlorobenzene	1.06338	1.07459	2.09		
1,4-Dichlorobenzene	1.18418	1.17367	.89		
p-Isopropyltoluene	1.33104	1.61241	21.13		
1,2-Dichlorobenzene	1.06893	1.06376	.36		

RF - Response Factor from daily standard file at 50.00 ng/l

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) CPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No: _____ Calibration Date: 11/16/89

Contractor: WAS Ranton Time: 06:16

Contract No: _____ Laboratory ID: 088426

Instrument ID: GC14 Initial Calibration Date: 10/20/89

Minimum $\overline{RF}$ for SPCC is 0.30 Maximum % Diff for CCC is 20%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC
n-Butylbenzene	1.25656	1.43458	25.08		
1,2-Dibromo-3-Chloropropane	.44143	.37326	16.92		
1,2,4-Trichlorobenzene	.67203	.70488	4.63		
Naphthalene	1.20648	1.20117	.44		
Hexachlorobutadiene	.45554	.47751	4.82		
1,2,3-Trichlorobenzene	.53030	.53706	.27		

RF - Response Factor from daily standard file at 50.00 ng/µL

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)