HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

October 13, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW 4th Avenue, Suite 400
Portland Oregon 97201

HAI Project No. 5237

SUBJECT: Response to Comments and Draft Work Plan for City Outfall 22C Evaluation, Phase I Site Characterization and Source Control Evaluation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

At the request of NW Natural, Hahn and Associates, Inc. (HAI) has prepared this letter response and Work Plan for additional characterization activities relating to City Outfall 22C, as requested by the Oregon Department of Environmental Quality (DEQ) in correspondence dated September 9, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt and Ms. Cathryn Young).

Background

Focused Remedial Investigation (RI) activities are being conducted at the Wacker property as per an October 2000 Unilateral Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the DEQ. The Order requires an investigation to "determine the nature and extent of releases of hazardous substances to Willamette River sediments from" the Wacker property.

One objective of the Focused RI is to evaluate whether contaminants from the Wacker property are migrating at adverse levels to the Willamette River sediments via stormwater outfalls. As identified within the *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon,* dated June 1, 2001, four outfalls have been identified at or adjacent to the site. These four outfalls, depicted on Figure 1, are identified as follows:

- On-site combined process water / stormwater outfall
- On-site Fab 2 area stormwater outfall
- On-site administration building roof drain outfall
- Off-site City of Portland Outfall 22C

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Investigation activities related to the three on-site outfalls have been completed, with an evaluation of the investigation findings to be presented within the forthcoming Technical Memorandum on Source Control Measures by Anchor Environmental, LLC (Anchor). Proposed investigation activities relating to City Outfall 22C have not been completed by NW Natural due difficulties in gaining legal property access from the Burlington Northern Santa Fe Railroad Company (BNSF), the owner of the property adjacent to Wacker containing drainage features that convey surface water to City Outfall 22C.

Although NW Natural has to date not received legal access to the BNSF property, as reported in correspondence dated July 7, 2003 (Mr. Robert Ede to Mr. Matt McClincy), investigation activities associated with the BNSF drainage ditch have been recently conducted by AMEC Earth and Environmental, Inc. (AMEC) as part of the adjacent Rhone-Poulenc RI. The activities completed by AMEC in August 2002 were similar to those proposed by NW Natural, but with the addition of surface water testing within a portion of the drainage ditch and at the point of discharge to the Willamette River (City Outfall 22C).

As provided within HAI's July 7, 2003 evaluation of AMEC's Outfall 22C investigation results, the AMEC sampling did not identify the presence of volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) in discharged water from Outfall 22C at concentrations in excess of screening criteria, and metals concentrations did not appear to be present at concentrations exceeding typical background or urban run-off levels. Therefore, HAI concluded that results of the existing AMEC studies were sufficient to support the Source Control Evaluation relative to City Outfall 22C and that additional investigation or evaluation of this pathway to the river sediments is not warranted.

DEQ Comments / Request for Additional Investigation

In correspondence dated September 9, 2003, the DEQ provided comments concerning the July 7, 2003 City Outfall 22C evaluation described above. Specifically, DEQ identified several areas deemed to be data gaps requiring follow-up. A summary of DEQ's comments, followed by HAI's responses, are as follows:

- The DEQ letter provided a description of its proposed screening approach for evaluation of potential impacts to the Willamette River. The desired screening approach requires comparison of site surface water or groundwater data with both human and ecological (aquatic life) criteria. For aquatic life, chronic values provided in the Ambient Water Quality Criteria (AWQC) are to be used, or if none exist, then DEQ Level II screening values (SLVs) are to be used. For human health, AWQC levels that are protective of the human consumption of fish are to be used. At stormwater discharge points, use of 5 times the SLV or AWQC is appropriate for use as a screen.

  Response: Based on the screening approach described above, screening criteria with regard to the discharge of water from City Outfall 22C required slight revision. As depicted on Table 1, screening criteria were updated to include both

the 5x AWQC for human consumption of fish and the 5x AWQC or 5x DEQ SLV established for protection of aquatic life.

As depicted in Table 1, the updated screening approach identified concentrations of arsenic, barium, boron, copper, iron, manganese, and silver exceeding the revised screening criteria at City Outfall 22C. All of the preceding metals are naturally occurring in the environment. Barium, boron, and silver are not chemicals of interest with regard to the Wacker RI, thereby leaving arsenic, copper, iron and manganese for follow-up evaluation.

- The DEQ letter indicates that the concentration of fluorene identified in the City Outfall 22C sample exceeded the applicable screening level for this constituent. Further, DEQ suggests that laboratory reporting levels for benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were greater than screening criteria.

  Response: Because the screen is being conducted with regard to a stormwater discharge point (City Outfall 22C), DEQ's proposed screening levels would incorporate a 5x multiplier. As presented in Table 1, the concentration of fluorene identified at City Outfall 22C (6.26 µg/l) is less than the screening value of 19.5 µg/L. Further, laboratory reporting levels for all constituents were at concentrations less than the stormwater screening levels (Table 1).

- The DEQ notes that the AMEC sampling activities related to Outfall 22C did not include cyanide.

  Response: Cyanide is a constituent of interest with regard to the Focused Wacker RI, and the absence of cyanide data with regard to Outfall 22C does represent a data gap. Further evaluation with regard to cyanide levels at City Outfall 22C is justified.

- The DEQ letter indicates that some AWQC established for metals are hardness dependant and need to be adjusted accordingly, assuming a hardness for the Willamette River of 25 milligrams per liter (mg/L).

  Response: AWQC for the metals cadmium, copper, lead, nickel, silver, and zinc were adjusted based on an assumed hardness of 25 mg/L. Although chromium III is hardness dependent, speciated data for this metal was not collected. To be conservative with regard to potential risk, it has been assumed all chromium is in the more toxic VI form. Chromium VI is not hardness dependent, and therefore no adjustment was necessary.

- The DEQ letter indicates that further evaluation is necessary to establish background water quality for metals for either stormwater or groundwater. Specifically, the DEQ indicates that 1) groundwater samples collected from push probe sample locations should not be used to establish background water quality for metals; 2) that well MW-9-29, located at the adjacent Gasco site is not suitable for a determination of background water quality; and 3) that use of literature-obtained values for typical rooftop or urban run-off concentrations is not appropriate.

  Response: The intent of the July 7, 2003 evaluation was not to establish definitive background water quality concentrations for either groundwater or for stormwater. Instead, the intent was to use data from multiple sources in an effort to evaluate the likelihood that the metals concentrations identified at City Outfall 22C were typical of what might be expected to discharge from such an outfall. Thus, the comparisons with shallow groundwater quality data (MW-9 and P-7), and typical urban run-off concentrations, as derived from a literature review, were conducted.

  With regard to DEQ's specific comments, due to the presence of demolition debris and possible MGP-related materials in shallow soil, it is agreed that well MW-9-29 is not an ideal well for evaluating background water quality. However, this well was used to provide an indication of background water quality since the best tracer constituents for the presence of MGP-related impacts, PAHs and BTEX compounds, have never been identified in representative groundwater samples from this location. The impacts at MW-9-29 referred to by DEQ occurred in 1996 immediately after well construction and were unrepresentative, being an artifact from drilling through shallow impacted soil during construction. Regardless, due to the presence of shallow soil impacts at this well location, it is agreed that this well should not be used for establishment of background water quality.

  With regard to metals data obtained from the P-7 push probe location, it is unclear why the use of these data as a background water quality screen is deemed not appropriate. No PAH or VOC impacts were identified at the P-7 location, suggesting the area to be free of contaminants of interest. With regard to increased turbidity in push probe water samples, it is noted that all metals samples were field filtered, and therefore reflected dissolved concentrations only. Again, although it may not be recommended to establish definitive background metals concentrations for groundwater based on dissolved results, the data should be available for use as a general screening option, especially when one is making the conservative assumption of using dissolved metals concentrations as a screen against total metals results.

  Finally, it is unclear why DEQ feels that comparison of discharge from City Outfall 22C with literature-derived values for typical urban run-off is not acceptable. Without site-specific background stormwater data, such a comparison is critical in evaluating whether conditions at Wacker may be adversely impacting discharges through this outfall.

To more fully address the background water quality issue, additional evaluation with regard to background concentrations within stormwater, including the collection of samples of surface water prior to its discharge to the Northwest Drainage Pond (NDP) or the BNSF property ditch, is included within the proposed Work Plan below.

- The DEQ letter requests submittal of a Work Plan for evaluation of Outfall 22C that includes a rainy season storm event, a rainy season non-storm event, and a dry weather sampling event. Additionally, the DEQ letter requests the sampling of groundwater discharging to the ditch leading to the Northwest Drainage Pond (NDP), the NDP, the City Outfall 22C sewer line, as well as sediment sampling in the NDP and/or the ditches leading to the NDP. DEQ requested analyses for VOCs, SVOCs, cyanide, and metals.

  Response: As indicated in the responses above, NW Natural agrees to perform additional evaluation of potential Wacker site-related impacts to discharges from City Outfall 22C. However, for the reasons stated below, HAI proposes a modified scope.

  Because the previously discussed Outfall 22C discharge samples were collected at a time when the contribution of Wacker-related site contaminants would be the greatest (i.e., all discharge would have been related to groundwater from the vicinity of the Wacker property, with no dilution from stormwater derived from the remaining drainage basin), follow-up investigation activities are only necessary for those metals that exceed screening values at the outfall and to collect cyanide data. During other times of the year, the low concentrations of previously detected chemicals in groundwater seepage at the Wacker site would only be further diluted by increased seepage and stormwater flow from the remaining Outfall 22C drainage area, which occupies an area in excess of 1,000 acres.

  Groundwater, NDP, and ditch water sampling, as well as sediment sampling in the ditch and NDP are warranted only if it is determined that discharge from Outfall 22C exceeds screening and background levels. As such, the additional investigation activities proposed at this time do not include these tasks. However, one or more of these tasks may be necessary if MGP-related materials are determined to cause unacceptable risk at the discharge from Outfall 22C.

WORK PLAN FOR ADDITIONAL SOURCE CHARACTERIZATION - CITY OUTFALL 22C

Objectives

- To collect and evaluate supplemental data for cyanide, a previously unevaluated constituent of interest, in discharge from City Outfall 22C. If cyanide is identified at concentrations greater than screening levels, then an evaluation of the potential for cyanide to be attributable to Wacker site-related sources of contamination will be completed.

- To evaluate whether those metals discharging from City Outfall 22C at concentrations greater than screening levels are attributable to Wacker site-related sources of contamination.

Scope of Work

Stormwater / effluent samples will be collected from City Outfall 22C at three times as described below

1) During the rainy season (Winter/Spring) at the time of a storm event that is greater than 0.1 inches in magnitude, and that occurs at least 72 hours from the previous measurable (greater than 0.1 inches rainfall) storm event.

2) During the dry season (Summer/Fall) at the time of a storm event that is greater than 0.1 inches in magnitude, and that occurs at least 72 hours from the previous measurable (greater than 0.1 inches rainfall) storm event.

3) During the rainy season (Winter/Spring) during a dry interval (i.e., at least 7 days subsequent to the previous storm event).

During each sampling event, representative grab samples of the water discharging from City Outfall 22C will be obtained by hand by directly filling sample containers from the outfall pipe. At the same time, grab samples will be collected in the same manner of water discharging from the two culvert pipes located at the northwestern end of the BNSF ditch (e.g., the Koppers Industries, Inc. culvert and the NW St. Helens Road culvert), and from North Doane Lake at the entrance to the pipe leading to the NDP. The proposed sampling locations are depicted on Figure 1.

Samples collected from City Outfall 22C will be analyzed for total and amenable cyanide, as well as total arsenic, copper, iron, and manganese. All sample management and analyses will be as provided within the approved RI Work Plan (HAI, 2001).

Constituents found to exceed screening levels in the samples collected from Outfall 22C will subsequently be analyzed in those samples that were collected from culverts that discharge to the NDP/BNSF drainage ditch such that an evaluation of background water quality for these constituents may be conducted.

Schedule

The proposed work activities may commence once access has been obtained from BNSF. At this time, representatives of BNSF have returned an updated access agreement to NW Natural with their edits for review and approval. However, this current draft agreement is based on previous scope of work, which did not include sample collection. As discussed with a BNSF representative, a revised scope of work, to include physical collection of environmental samples, would require execution of a different type of access agreement. Once approval with regard to a scope of work has been received, all efforts will be made to expedite execution of the appropriate access agreement.

Should you have any questions concerning the above, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental LLC
Ms. Cheryl Rath, Schwabe, Williamson & Wyatt
Ms. Cathryn Young, Wacker Siltronic
Mr. Rod Struck, DEQ Northwest Region

TABLE 1 – Summary of AMEC Surface Water Testing Results, Detected Chemicals Only

Analytical Parameters	Laboratory Analytical Testing Results in ug/L (ppb)		Reference Levels in ug/L		
Sample Location ==>	Northwest Drainage Pond	City Outfall 22C	Ambient Water Quality Criteria x 5		DEQ Level II Screening Level Value [4] x 5
Sample Number ==>	NDP-101-W	CO-22C-01			
Sampled By [1] ==>	AMEC	AMEC			
Sample Date ==>	13-Aug-02	13-Aug-02	Human [2]	Aquatic [3]	
General Chemistry by EPA 160.2, 2340B, 300, 310.1					
Total Suspended Solids	93,000.	47,000.	#	#	#
Hardness	110,000.	290,000.	#	#	#
Chloride	14,000.	30,800.	#	1,150,000.	#
Sulfate	1,560.	4,710.	#	#	#
Alkalinity	**160,000.**	**360,000.**	#	**100,000.**	#
Volatile Organic Compounds (VOCs) by EPA 8260B					
Acetone	2.95	3.56	#	#	7,500.
Benzene	1.47	3.15	255.	#	650.
Chlorobenzene	0.5 U	0.605	105,000.	#	250.
iso-Propylbenzene	0.5 U	0.577	#	#	#
Naphthalene	5.89	13.4	#	#	3,100.
Toluene	0.563	0.5 U	1,000,000.	#	49.
Semi-Volatile Organic Compounds (SVOCs) by EPA 8270C					
Acenaphthene	9.53	32.5	4,950.	#	2,600.
Acenaphthylene	0.0144 U	0.182	#	#	#
Anthracene	0.184	0.456	200,000.	#	65.
Benzo(a)anthracene	**0.141**	0.0422 U	**0.09**	#	**0.135**
Benzo(ghi)perylene	0.163	0.0326 U	#	#	#
Benzo(b)fluoranthene	**0.453**	0.0365 U	**0.09**	#	#
Chrysene	**0.25**	0.024 U	**0.09**	#	#
Dibenzofuran	1.01	1.72	#	#	18.5
Fluoranthene	1.59	2.05	700.	#	30.8
Fluorene	1.16	6.26	26,500.	#	19.5
Indeno(1,2,3-cd)pyrene	**0.136**	0.0288 U	**0.09**	#	#
Naphthalene	0.0211 U	0.688	#	#	3,100.
Phenanthrene	0.0211 U	0.243	#	#	31.5
Pyrene	1.57	2.03	20,000.	#	#

Note: # = Screening Level not established
AWQC = Ambient Water Quality Criteria
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency

J = estimated concentration
ppb = parts per billion
U = not detected above concentration indicated
ug/l = micrograms/liter

Bold = Detected concentration exceeds bolded Screening Level

1 = AMEC Earth & Environmental, Inc., *Remaining Remedial Investigation Technical Memorandum, RPAC-Portland Site,* February 4, 2003.
2 = Lowest value provided in the Ambient Water Quality Criteria (EPA 822-R-02-047, November 2002) based on Fresh Acute / Fresh Chronic (Aquatic Life Protection)
3 = Lowest value provided in the Ambient Water Quality Criteria (EPA 822-R-02-047, November 2002) based on Fish Consumption Only (Human Health) pathway
4 = DEQ Level II Screening Level Values (SLVs) for Ecological Risk Assessment, revised December 2001
5 = AWQC adjusted based on a hardness of 25 parts per million.

TABLE 1 – Summary of AMEC Surface Water Testing Results, Detected Chemicals Only

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Sample Location ==>	Northwest Drainage Pond	City Outfall 22C	Ambient Water Quality Criteria x 5		DEQ Level II Screening Level Value [4] x 5
Sample Number ==>	NDP-101-W	CO-22C-01			
Sampled By [1] ==>	AMEC	AMEC			
Sample Date ==>	13-Aug-02	13-Aug-02	Human [2]	Aquatic [3]	
Total Metals by EPA 6010 or 6020					
Aluminum	**1,780.**	9. U	#	**435.**	**435.**
Arsenic	**11.6** J	**1.14** J	**0.7**	750.	750.
Barium	**96.4**	**56.9**	5,000.	#	**20.**
Boron	**121.**	**73.7**	#	#	**8.**
Cadmium[4]	0.016	0.0071 U	#	0.45 [5]	11.
Calcium	27,200.	70,800.	#	#	580,000.
Chromium	4.04	0.0354 U	#	55.	55.
Cobalt	9.52	2.74	#	#	115.
Copper[4]	11.1	**45.**	6,500.	**13.5** [5]	45.
Iron	**22,300.**	**19,100.**	**1,500.**	**5,000.**	**5,000.**
Lead[4]	**5.2**	0.082 U	#	**2.7** [5]	12.5
Magnesium	9,380.	26,700.	#	#	410,000.
Manganese	**2,660.**	**3,470.**	**500.**	#	**600.**
Molybdenum	44.1	13.6	#	#	1,850.
Nickel[4]	4.41	2.23	23,000.	80.5 [5]	260.
Potassium	2,270.	4,770.	#	#	265,000.
Silicon Dioxide	35,400.	42,600.	#	#	#
Silver	**0.8** U	**1.18**	#	16.	**0.6**
Sodium	25,300.	36,100.	#	#	3,400,000.
Vanadium	21. J	0.726 U	#	#	100.
Zinc[4]	**345.**	7.64 U	130,000.	**182.5** [5]	600.

Note: # = Screening Level not established
AWQC = Ambient Water Quality Criteria
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency

J = estimated concentration
ppb = parts per billion
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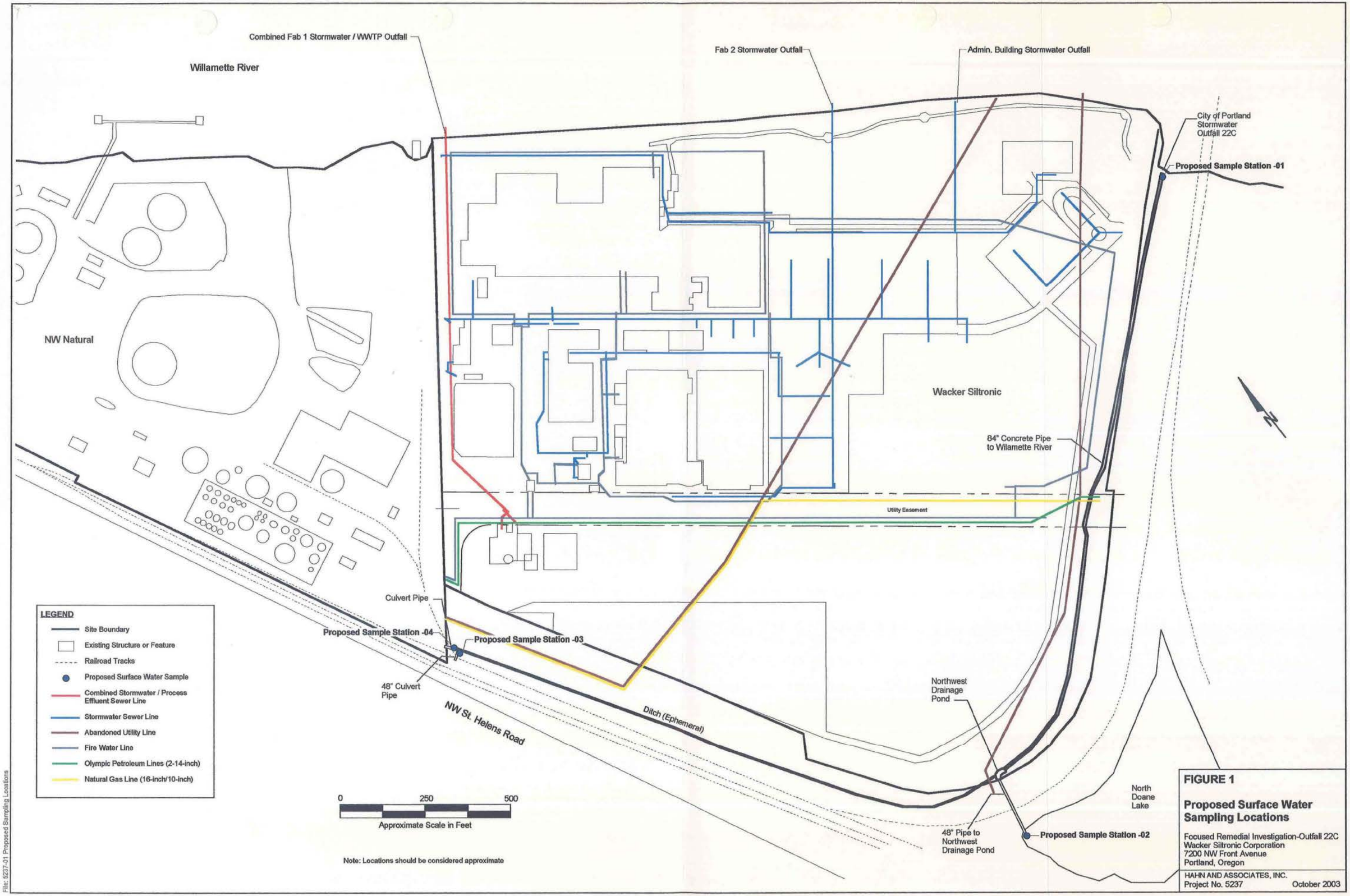

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HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

October 10, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland Oregon 97201-4987

HAI Project No. 5237

SUBJECT: September 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of September 2003. RI field activities for the site have been conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan[1] (RI Work Plan), as well as the approved Supplemental RI Work Plan[2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in September 2003

In correspondence dated September 9, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt), DEQ provided comments generated from review of NW Natural's August 13, 2003 off-site drainage ditch / Outfall 22C Source Control Evaluation. In this correspondence, DEQ requests the completion of additional investigation activities relating to the off-site drainage ditch / City Outfall 22C. DEQ has requested submittal of a Work Plan to address additional investigatory activities by October 13, 2003.

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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Anticipated / Completed Activities in October and November 2003

City Outfall 22C Evaluation

At the request of NW Natural, HAI is currently preparing a detailed response to DEQ's September 9, 2003 correspondence, including a Work Plan for completion of additional investigation activities relating to City Outfall 22C. The response to DEQ's comments and Work Plan for additional investigation activities will be submitted to DEQ on October 13, 2003.

Investigation activities to be proposed within the pending Outfall 22C Work Plan will require property access from BNSF. At this time, representatives of BNSF have returned an updated access agreement to NW Natural with their edits for NW Natural's review and approval. However, the current draft agreement is based on a previous scope of work, which did not include sample collection. As discussed with a BNSF representative, a revised scope of work, to include physical collection of environmental samples, would require execution of a different type of access agreement. Once approval with regard to a scope of work has been received from DEQ, all efforts will be made to expedite execution of the appropriate access agreement with BNSF.

RI Summary Report and Preliminary Source Control Evaluation Report

Drafts of the Phase I Site Characterization Report and Preliminary Source Control Evaluation Report are presently under internal quality control review prior to submittal to the DEQ. The current schedule provides for submittal of both report to DEQ by October 13, 2003. Completion of these reports have been somewhat delayed due to shifting focus of source control evaluation activities to City Outfall 22C during September and early October. Therefore, in order to facilitate completion of internal review of these documents, and as we discussed during our October 10, 2003 telephone conversation, the submittal date for these two reports has been extended to November 7, 2003.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Ms. Cheryl Rath, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

September 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

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Dear Mr. McClincy:

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Summary of Activities in August 2003

In correspondence dated July 7, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt), DEQ provided reference to investigation activities associated with the off-site Burlington Northern Santa Fe Railway (BNSF) drainage ditch / Outfall 22C that were conducted by AMEC Earth and Environmental, Inc. (AMEC) as part of the adjacent Rhone-Poulenc facility RI. These investigation activities included an evaluation similar to that proposed by NW Natural as part of the off-site ditch evaluation, in addition to limited surface water testing within a portion of the drainage ditch and at City of Portland Outfall 22C. During July and August, 2003, HAI reviewed the referenced documents and used the presented sampling results to conduct a source control evaluation related to the off-site drainage ditch/Outfall 22C. Results of this evaluation were submitted to the DEQ in correspondence dated August 13, 2003 (Rob Ede to Matt McClincy).

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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Anticipated / Completed Activities in September and October 2003

Off-Site Ditch Evaluation

In correspondence dated September 9, 2003 (Matt McClincy to Bob Wyatt), DEQ provides comments generated from review of the August 13, 2003 off-site drainage ditch /Outfall 22C Source Control Evaluation. In this correspondence, DEQ requests the completion of additional investigation activities related to the off-site drainage ditch. DEQ has requested submittal of a Work Plan to address additional investigatory activities by October 11, 2003. NW Natural will review the specifics of this request and will follow-up with DEQ in the near future.

With regard to legal access to the off-site ditch (BNSF property immediately west and south of the Wacker property), a proposed Access Agreement has been reviewed and approved by NW Natural. This proposed Access Agreement was previously provided to representatives of BNSF by NW Natural. Due to lack of contact from BNSF, in correspondence dated August 13, 2003, HAI returned a second copy of the proposed agreement, as approved by NW Natural, to Ms. Shane Krueger of the Staubach Company (the BNSF representative responsible for reviewing and approving the Agreement).

Ms. Julie Alexander of the Staubach Company contacted HAI on September 15, 2003 and indicated that the proposed Agreement will be forwarded to their Legal Department for review. Ms. Alexander indicated that NW Natural would be contacted subsequent to this review regarding the acceptability of the proposed Agreement. Additionally, should the scope of the proposed activities change (e.g., incorporation of environmental sampling as requested by DEQ), then a new Agreement would be necessary. Ms. Alexander could not provide an estimated time-frame for completion of Staubach's review of the proposed Agreement.

RI Summary Report

During September 2003, NW Natural will work on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. These documents are scheduled for submittal to DEQ in October 2003.

Wacker-Related RI Activities

NW Natural understands that work plans and results of Wacker's own trichloroethene-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
ENVIRONMENTAL AFFAIRS

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7200 N.W. Front Avenue, MS 30
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Tel. 503-219-7406
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cathryn.young@wacker.com

FAX

September 19, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

4 Page(s) incl. coversheet

HAI August 2003 Progress Report

****
*** TX REPORT ***
****

TRANSMISSION OK

TX/RX NO	0873
CONNECTION TEL	95035987373
CONNECTION ID	JORDAN SCHRADER
ST. TIME	09/19 14:07
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PGS. SENT	4
RESULT	OK

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
ENVIRONMENTAL AFFAIRS

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HAI August 2003 Progress Report

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

August 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: July 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of July 2003. RI field activities for the site are being conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan[1] (RI Work Plan), as well as the approved Supplemental RI Work Plan[2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in July 2003

In correspondence dated July 7, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt), DEQ provides reference to investigation activities associated with the off-site Burlington Northern Santa Fe Railway (BNSF) drainage ditch / Outfall 22C that were conducted by AMEC Earth and Environmental, Inc. (AMEC) as part of the adjacent Rhone-Poulenc facility RI. These investigation activities included evaluation activities similar to those proposed by NW Natural as part of the off-site ditch evaluation, in addition to limited surface water testing within a portion of the drainage ditch and at City of Portland Outfall 22C. During July, HAI reviewed the referenced documents and used the presented sampling results to conduct a source control evaluation related to the off-site drainage ditch/Outfall 22C.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503-796-0717 Telephone • 503-227-2209 Facsimile

Anticipated / Completed Activities in August and September 2003

The source control evaluation related to the off-site drainage ditch / Outfall 22C, as described above, was submitted to the DEQ in correspondence dated August 13, 2003.

As provided in the RI Work Plan, the only outstanding RI data collection task yet to be completed by NW Natural involves an inspection and elevation survey of the drainage ditch located on the BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed Access Agreement has been reviewed and approved by NW Natural. This proposed Access Agreement was previously provided to representatives of BNSF by NW Natural. Due to apparent miscommunication between representatives of BNSF, NW Natural had not received any follow-up information concerning the status of the Access Agreement. In August, HAI returned a second copy of the proposed agreement, as approved by NW Natural, to Ms. Shane Krueger of the Staubach Company, the BNSF representative responsible for reviewing and approving the Agreement.

NW Natural is presently awaiting approval and execution of the Access Agreement by BNSF. However, as the activities to be conducted on the BNSF property have already been completed by AMEC, and results of the source control evaluation (as provided in the August 13, 2003 correspondence) do not indicate the need for additional investigation, NW Natural believes the off-site access is no longer necessary. However, until such a time that DEQ indicates agreement with the source control evaluation, NW Natural will continue to pursue the Access Agreement with BNSF.

During August and September 2003, NW Natural will work on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. These documents are scheduled for submittal to DEQ in October 2003.

NW Natural understands that work plans and results of Wacker's own trichloroethene-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
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FAX

August 20, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

4 Page(s) incl. coversheet

Re: HAI July 2003 Progress Report

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

August 13, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW 4th Avenue, Suite 400
Portland Oregon 97201

HAI Project No. 5237

SUBJECT: Off-Site Ditch Evaluation, Phase I Site Characterization and Source Control Evaluation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

At the request of NW Natural, Hahn and Associates, Inc. (HAI) has prepared this letter in response to the Oregon Department of Environmental Quality (DEQ) correspondence dated July 7, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt) concerning the status of NW Natural's activities related to the Focused Remedial Investigation (RI) and the pending Technical Memorandum on Source Control Measures.

Specifically, the referenced correspondence provides comments related to three elements of the focused RI, as follows; 1) evaluation of the drainage ditch located on Burlington Northern Santa Fe Railway (BNSF) property immediately west and south of the Wacker property, 2) the schedule for completion of the Phase I Site Characterization Summary Report, and 3) contents and schedule for completion of the Technical Memorandum on Source Control Measures.

Off-Site Ditch Evaluation

As proposed in NW Natural's approved *Final Focused RI Work Plan*[1] for the property, the BNSF drainage ditch evaluation is to involve a visual inspection and elevation survey of the drainage ditch located on BNSF property to support a determination as to the potential for the ditch to receive groundwater recharge from the Wacker property. The proposed ditch evaluation activities have not been completed to date since receipt of legal access to the property from BNSF has not been received.

DEQ's correspondence provided reference to investigation activities associated with the BNSF drainage ditch recently conducted by AMEC Earth and Environmental, Inc. (AMEC) as part of the adjacent Rhone-Poulenc RI. DEQ indicated these investigation activities were similar to those proposed by NW Natural in the RI Work Plan, but with the addition of surface water testing within a portion of the drainage ditch and at the point of discharge to the Willamette River via City of Portland (City) Outfall 22C.

1 Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

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Based on the preceding, the DEQ requested NW Natural review results of AMEC's investigation activities as summarized within February 2003[2] and March 2003[3] reports. In light of the activities already completed, DEQ requested NW Natural prepare an updated proposal for evaluating the possible presence of Wacker site-related impacts to the Willamette River via discharges from the off-site drainage ditch/City Outfall 22C.

Based on NW Natural's review of the referenced AMEC reports, it does appear there is sufficient documentation available at this time to indicate the presence of localized shallow groundwater discharge to the southwestern portion of the drainage ditch at the Northwest Drainage Pond (NDP). This documentation includes a lower elevation of the NDP relative to the adjacent water table (as measured at WS-7), as well as the observation of a groundwater seep above the NDP.

The NDP (Figure 1) is a small water body (approximately 35 feet by 15 feet in dimension) at the downstream end of the off-site ditch at the point where discharge into the City of Portland's 84-inch diameter concrete outfall pipe occurs. The concrete pipe follows Wacker's southern property boundary and discharges to the Willamette River at City Outfall 22C (Figure 1). AMEC's evaluation of the portion of the drainage ditch upstream of the NDP (located adjacent to Wacker's western property boundary) indicated the ditch to be ephemeral – meaning flow would only occur in direct response to a precipitation event. As such, the presence of significant groundwater discharge to portions of the ditch located upstream of the NDP is not suspected.

In August 2002, AMEC collected a sample of surface water within the NDP as well as of the water discharging to the Willamette River at Outfall 22C (AMEC, 2003a). AMEC noted the ditch feeding the NDP was dry at the time of sampling, thereby indicating the source of discharge at City Outfall 22C would have likely been composed entirely of groundwater sourced via the NDP as well as possible groundwater influx along the length of the concrete pipe. An evaluation of the results of available data related to City Outfall 22C is provided below.

City of Portland Outfall 22C Source Control Evaluation

Analytical results from AMEC's August 2002 sampling of the NDP and Outfall 22C are summarized on Table 1. Analytical results have been screened against Ambient Water Quality Criteria (AWQC) promulgated under section 304(a) of the Clean Water Act. AWQC include acute and chronic criteria for the protection of aquatic life and criteria for the protection of human health based on combined fish and water consumption and fish consumption alone. Because current and reasonably likely future uses of the Willamette River within Portland Harbor do not include drinking water, only the fish consumption

[2] AMEC Earth and Environmental, Inc. (2003a). *Remaining Remedial Investigation Technical Memorandum RPAC – Portland Site*, February 4, 2003.

[3] AMEC Earth and Environmental, Inc. (2003b). *Final Groundwater Characterization Report RPAC – Portland Site*, March 28, 2003.

AWQCs for protection of human health have been used as a screen. In cases where AWQC do not exist, DEQ Level II screening level values (SLVs) for surface water, developed as part of its ecological risk assessment guidance, were utilized to screen for the protection of ecological receptors.

As summarized in Table 1, several volatile organic compounds (VOCs), including acetone, benzene, chlorobenzene, iso-propylbenzene, and toluene, as well as dibenzofuran and several polynuclear aromatic hydrocarbons (PAHs) and metals, were present at detectable concentrations in surface water at the NDP and/or City Outfall 22C. Screening results of these data are summarized below.

- No VOCS were identified at either the NDP or City Outfall 22C at concentrations exceeding screening levels.
- No PAHs or other semi-volatile organic compounds were detected at City Outfall 22C at concentrations exceeding screening levels. The PAHs benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were identified at concentrations greater than screening levels at the NDP.
- The metals arsenic, barium, boron, copper, iron, and manganese were identified at City Outfall 22C at concentrations exceeding screening levels. The metals arsenic, aluminum, barium, boron, copper, iron, lead, manganese, vanadium, and zinc were identified at the NDP at concentrations greater than screening levels.

With regard to the metals identified at City Outfall 22C, only arsenic, copper, iron, and manganese are Constituents of Interest (COIs) relative to the Wacker RI. Although identified at concentrations higher than screening criteria, the identified concentrations are within ranges normally expected for urban runoff or background groundwater quality, as follows:

- The concentration of arsenic at City Outfall 22C {1.14 part per billion (ppb)} is less than the concentration identified in surficial fill background well MW-9-29 located at the nearby NW Natural Gasco Site, where arsenic concentrations between 6 ppb and 15 ppb have been identified[4]. Further, dissolved arsenic concentrations greater than 1.14 ppb have been identified throughout the Rhone-Polenc study area, where the identified concentrations have been similarly attributed to background (AMEC, 2003b).
- The concentration of copper at City Outfall 22C (45 ppb) is less than the concentration identified in surficial fill background well MW-9-29 located at the nearby NW Natural Gasco Site, where copper concentrations between 5 ppb

[4] Hahn and Associates, Inc. (2003). *Second Half 2002 Progress Report for Remedial Investigation, NW Natural, Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon.* April 30, 2003.

and 350 ppb have been identified. Further, the identified concentration is within the range documented for urban run-off (between 3 ppb and 166 ppb)[5].

- The concentration of iron at City Outfall 22C (19,100 ppb) is less than the 23,000 ppb median concentration of iron identified in a study of street run-off[6]. Further, although background water quality data for iron is not available for the Wacker or adjacent Gasco Site, groundwater data from temporary well point P-7, a location where no organic COIs were identified (and therefore no obvious site-related impacts), indicated the presence of 45,200 ppb dissolved iron within shallow groundwater.
- Literature values of typical urban run-off concentrations for manganese could not be identified. However, the concentration at City Outfall 22C (3,470 ppb), is less than the 6,400 ppb dissolved concentration identified at the P-7 temporary well point location (described above).

Conclusions

- Sampling at City Outfall 22C at the time when much, if not all, of the discharge would be attributable to groundwater seepage, did not indicate the presence of VOCs or PAHs at concentrations in excess of screening criteria, nor did it identify the presence of metals at concentrations exceeding typical background or urban run-off levels.
- Even with all water observed discharging from City Outfall 22C likely consisting of groundwater, screening indicates the discharge is not resulting in impacts to current or reasonably likely future beneficial uses to the Willamette River.
- Results of the existing AMEC studies appear sufficient to support the Source Control Evaluation relative to City Outfall 22C. Additional investigation or evaluation of this pathway to the river is not warranted.

[5] Watershed Protection Techniques. (2003). *Is Rooftop Runoff Really Clean?* Article 8 –Technical Note #25 from Watershed Protection Techniques: 1(2):84-85. Accessed 2003 at http://www.stormwatercenter.net/Practice/.

[6] Watershed Protection Techniques. (2003). *Sources of Urban Stormwater Pollutants Defined in Wisconsin-* Article 7 –Technical Note #15 from Watershed Protection Techniques: 1(1):30-31. Accessed 2003 at http://www.stormwatercenter.net/Practice/.

Phase I Site Characterization Summary Report

DEQ requested that NW Natural proceed with the preparation of the Phase I Site Characterization Summary Report at this time, with the report being deliverable to DEQ in 90 days. NW Natural is in agreement with DEQ's request, and will have the Summary Report available for DEQ review by October 13, 2003. The Summary Report will include the site-wide summary of field evidence of contamination (as non-aqueous phase liquid), as requested in DEQ's July 7, 2003 correspondence.

Technical Memorandum on Source Control Measures

DEQ requested the schedule for submittal of the Technical Memorandum on Source Control Measures be revised to allow consideration of results related to Wacker's ongoing trichloroethene (TCE) investigation. NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by Wacker to the DEQ. NW Natural believes that it has collected sufficient information, including sufficient information on groundwater flow at the Wacker site, to complete the Technical Memorandum. If additional data become available that would affect the evaluation of source control measures for petroleum compounds (i.e. groundwater flow direction information from the Wacker investigation), NW Natural will incorporate that information into the Technical Memorandum, or revise the Technical Memorandum accordingly. Therefore, NW Natural does not believe it is necessary to make a specific modification to the schedule for submittal of the Technical Memorandum on Source Control Measures without knowing when such data will actually be available or which data may be pertinent. Results of the City of Portland Outfall 22C sediment study referred to in the July 7, 2003 letter may be reviewed and discussed within the Source Control Memorandum, assuming this report is available in the near future.

Should you have any questions concerning the above, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate
rede@hahnasoc.com

Attachments: 2
Figure 1
Table 1

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental LLC
Ms. Cathryn Young, Wacker Siltronic
Mr. Rod Struck, DEQ Northwest Region

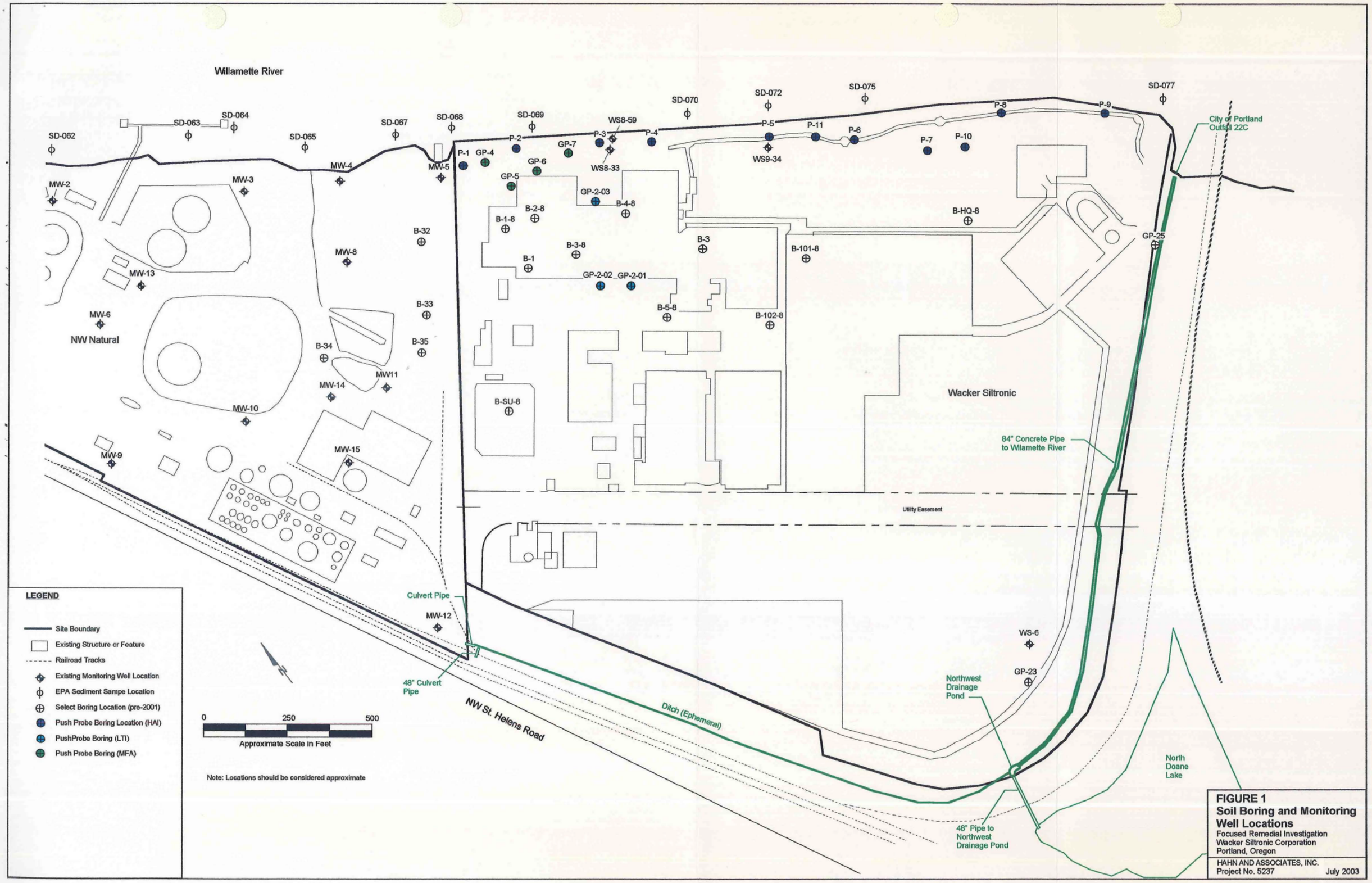


FIGURE 1
Soil Boring and Monitoring Well Locations
Focused Remedial Investigation
Wacker Siltronic Corporation
Portland, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 5237 July 2003

TABLE 1 – Summary of Surface Water Testing Results, Detections Only

Analytical Parameters	Laboratory Analytical Testing Results in ug/L (ppb)		Reference Levels in ug/L	
Sample Location ==>	Northwest Drainage Pond	City Outfall 22C	Ambient Water Quality Criteria[2]	DEQ Level II Screening Level Values[3]
Sample Number ==>	NDP-101-W	CO-22C-01		
Sampled By [1] ==>	AMEC	AMEC		
Sample Date ==>	13-Aug-02	13-Aug-02		
General Chemistry by EPA 160.2, 2340B, 300, 310.1				
Total Suspended Solids	93,000.	47,000.	#	#
Hardness	110,000.	290,000.	#	#
Chloride	14,000.	30,800.	#	#
Sulfate	1,560.	4,710.	#	#
Alkalinity	160,000.	360,000.	#	#
Volatile Organic Compounds (VOCs) by EPA 8260B				
Acetone	2.95	3.56	#	1,500.
Benzene	1.47	3.15	51.	
Chlorobenzene	0.5 U	0.605	21,000.	
iso-Propylbenzene	0.5 U	0.577	#	#
Naphthalene	5.89	13.4	#	620.
Toluene	0.563	0.5 U	200,000.	
Semi-Volatile Organic Compounds (SVOCs) by EPA 8270C				
Acenaphthene	9.53	32.5	990.	
Acenapthylene	0.0144 U	0.182	#	#
Anthracene	0.184	0.456	40,000.	
Benzo(a)anthracene	**0.141**	**0.0422** U	0.018	
Benzo(ghi)perylene	0.163	0.0326 U	#	#
Benzo(b)fluoranthene	**0.453**	**0.0365** U	0.018	
Chrysene	**0.25**	**0.024** U	0.018	
Dibenzofuran	1.01	1.72	#	3.7
Fluoranthene	1.59	2.05	140.	
Fluorene	1.16	6.26	5,300.	
Indeno(1,2,3-cd)pyrene	**0.136**	**0.0288** U	0.018	
Naphthalene	0.0211 U	0.688	#	620.
Phenanthrene	0.0211 U	0.243	#	6.3
Pyrene	1.57	2.03	4,000.	

TABLE 1 – Summary of Surface Water Testing Results, Detections Only

Analytical Parameters	Laboratory Analytical Testing Results in ug/L (ppb)		Reference Levels in ug/L	
Sample Location ==>	Northwest Drainage Pond	City Outfall 22C	Ambient Water Quality Criteria[2]	DEQ Level II Screening Level Values[3]
Sample Number ==>	NDP-101-W	CO-22C-01		
Sampled By [1] ==>	AMEC	AMEC		
Sample Date ==>	13-Aug-02	13-Aug-02		
Total Metals by EPA 6010 or 6020				
Arsenic	**11.6** J	**1.14** J	0.14	
Aluminum	**1,780.**	9. U	#	87.
Barium	**96.4**	**56.9**	#	4.
Boron	**121.**	**73.7**	#	1.6
Cadmium	0.016	0.0071 U	0.25	
Calcium	27,200.	70,800.	#	116,000.
Chromium	4.04	0.0354 U	11.	
Cobalt	9.52	2.74	#	23.
Copper	**11.1**	**45.**	9.	
Iron	**22,300.**	**19,100.**	#	1,000.
Lead	**5.2**	0.082 U	2.5	
Magnesium	9,380.	26,700.	#	82,000.
Manganese	**2,660.**	**3,470.**	#	120.
Molybdenum	44.1	13.6	#	370.
Nickel	4.41	2.23	52.	
Potassium	2,270.	4,770.	#	53,000.
Silicon Dioxide	35,400.	42,600.	#	#
Silver	0.8 U	1.18	3.2	
Sodium	25,300.	36,100.	#	680,000.
Vanadium	**21.** J	0.726 U	#	20.
Zinc	**345.**	7.64 U	120.	

Note: 1 = AMEC Earth & Environmental, Inc., *Remaining Remedial Investigation Technical Memorandum, RPAC-Portland Site,* February 4, 2003.

2 = Lowest value provided in the Ambient Water Quality Criteria (EPA 822-R-02-047, November 2002) based on Fresh Acute, Fresh Cronic (Aquatic Life Protection) and Fish Consumption Only (Human Health) Pathway.

3 = Where no AWQC are available, DEQ Level II Screening Level Values for Ecological Risk Assessment were used, Revised December 2001.

Bold = Concentration exceeds Reference Level
AWQC = Ambient Water Quality Criteria
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
J = estimated concentration
ppb = parts per billion
U = not detected above concentration indicated
ug/l = micrograms/liter
= Reference Level not established

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

August 6, 2003

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Outfall 22-C Sampling Data

Dear Bob and Cathryn:

Bob brought to my attention that the Department of Environmental Quality (DEQ) had not provided copies of the lab reports from the samples DEQ collected at Outfall 22-C on August 9, 2002. Attached is a copy of the DEQ lab report. Please let me know if you have any questions.

Sincerely,

Matt McClincy
Project Manager
Cleanup and Portland Harbor Section

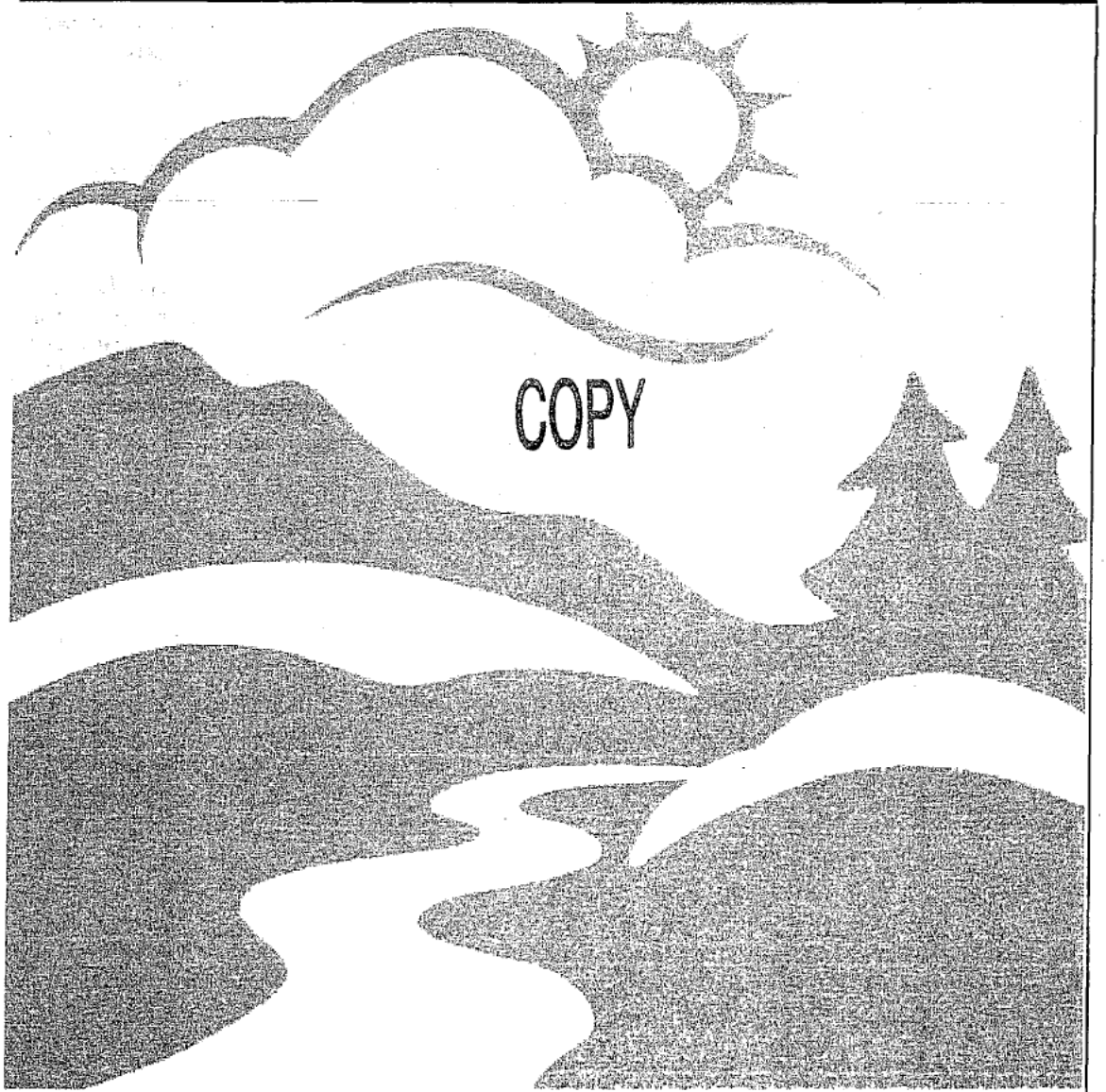
20020870

Analytical Report

OUTFALL 22-C

Sampling Event: 20020870

Report to: Eric Blischke, Waste Management Printed: October 15, 2002



DEQ

State of Oregon
Department of
Environmental
Quality

Laboratory Division
1712 SW 11th Avenue
Portland, OR 97201
Phone: (503) 229-5983
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www.deq.state.or.us

Final Report Approved by:

Mary Abrams, Laboratory Manager

Chris Redman, Laboratory QA Manager

PRINTED ON RECYCLED PAPER

CASE NARRATIVE

The official final laboratory report carries the original signatures of the laboratory Quality Assurance Officer and Division Administrator, and is retained by the laboratory. All unsigned and electronic copies of this report are unofficial copies of the original document. The title page of the report bears the name of the primary document recipient. Questions as to the integrity of the data contained in this report should be directed first to the report's primary recipient and second to the laboratory. The laboratory maintains all raw data and records from which this report has been generated for a period of no less than five years. Additional electronic and/or printed copies of this report can be obtained by contacting the laboratory.

The DEQ Laboratory employs in its operations standard analytical methods that have been adopted by governing agencies for their specific application to sample matrices and regulatory programs of interest. In cases where standard analytical methods have not been promulgated, the laboratory has developed "in-house" methods which are consistent with best laboratory operating practices that will result in data of a quality appropriate for the intended use of information. Furthermore, all data has been scrutinized for adherence to established Quality Assurance/Quality Control (QA/QC) guidelines. Unless otherwise noted, the information contained in this report meets all the aforementioned requirements as documented in the laboratory's Quality Assurance Manual and Standard Operating Procedures. Specific deviations from these requirements are noted, as appropriate, in this report. Questions or concerns regarding the contents of this report can be addressed by contacting the DEQ laboratory at 503.229.5983.

On 09 August 2002, the DEQ laboratory received four samples collected near an industrial outfall, located on the Willamette River, just north of the Burlington Northern-Sante Fe Railroad bridge in Portland, Oregon. The samples included two surface water samples, one sediment, and one "trip blank."

Due to an error at log-in of the samples following receipt, the laboratory failed to assign analyses for volatile organic compounds (VOCs) to the samples. Consequently, only polyaromatic hydrocarbons (PAHs) and semi-volatile organic compounds (SVOCs) were analyzed in one of the surface water samples (Item 003 - stream below outfall) and the sediment sample (Item 002 - sediment below outfall). At the point when the error was discovered, concentrations measured from VOC analyses would not have been valid. A number of PAHs and SVOCs were identified in both the surface water and sediment samples. Sediment results have been reported in units of mg/kg dry mass.

All standard laboratory procedures were followed during the analyses of these samples.

rad/15 oct 02

Att: Request for Analysis
QA/QC Reports

cc: DEQ Laboratory File

DEPARTMENT OF ENVIRONMENTAL QUALITY LABORATORY

Analytical Report

Sample Summary

Item	QA	Station		Sample Matrix	Sample Date	Sample Time
001	S	10000	Stream below outfall	Surface water	9-Aug-2002	11:00
002	S	10000	Sediment below outfall	Sediment	9-Aug-2002	11:10
003	S	10000	Trip blank	Surface water	9-Aug-2002	

Key to QA/QC Types

S = Sample
FP = Sample - Field Primary
FD = Sample - Field Duplicate
FB = Equipment Blank (Field Blank)
TSFB = Transfer Blank
TNPB = Transport Blank
LRB = Lab Retained Blank
Sp = Split with external lab

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
001	**10000 - Stream below outfall, 8/9/2002 11:00**					
Polynuclear Aromatic Hydrocarbons by GC/MS SIM						
	Naphthalene	8270 SIM	0.00029	**0.00163**	µg/L	
	Acenaphthylene	8270 SIM	0.00029	<0.00029	µg/L	
	Acenaphthene	8270 SIM	0.00029	**0.0227**	µg/L	
	Dibenzofuran	8270 SIM	0.00029	**0.00074**	µg/L	
	Fluorene	8270 SIM	0.00029	**0.00458**	µg/L	
	Dibenzothiophene	8270 SIM	0.00029	**0.00039**	µg/L	
	Phenanthrene	8270 SIM	0.00029	<0.00029	µg/L	
	Anthracene	8270 SIM	0.00029	<0.00029	µg/L	
	Fluoranthene	8270 SIM	0.00029	**0.00144**	µg/L	
	Pyrene	8270 SIM	0.00029	**0.00181**	µg/L	
	Benzo[a]anthracene	8270 SIM	0.00029	<0.00029	µg/L	
	Chrysene	8270 SIM	0.00029	<0.00029	µg/L	
	Benzo[b]fluoranthene	8270 SIM	0.00029	<0.00029	µg/L	
	Benzo[k]fluoranthene	8270 SIM	0.00029	<0.00029	µg/L	
	Benzo(a)pyrene	8270 SIM	0.00029	<0.00029	µg/L	
	Perylene	8270 SIM	0.00029	<0.00029	µg/L	
	Indeno[1,2,3-cd]pyrene	8270 SIM	0.00029	<0.00029	µg/L	
	Dibenz[a,h]anthracene	8270 SIM	0.00029	<0.00029	µg/L	
	Benzo[ghi]perylene	8270 SIM	0.00029	<0.00029	µg/L	
Semi-volatile Organic Compounds by GC/MS						
	Phenol	8270 C	0.003	<0.003	mg/L	
	Bis(2-Chloroethyl) ether	8270 C	0.003	<0.003	mg/L	
	Dibenzo(a,h)anthracene	8270 C	0.003	<0.003	mg/L	
	Benzo(g,h,i)perylene	8270 C	0.003	<0.003	mg/L	
	2-Chlorophenol	8270 C	0.003	<0.003	mg/L	
	1,3-Dichlorobenzene	8270 C	0.003	<0.003	mg/L	
	1,4-Dichlorobenzene	8270 C	0.003	<0.003	mg/L	
	1,2-Dichlorobenzene	8270 C	0.003	<0.003	mg/L	
	Bis(2-Chloroisopropyl) ether	8270 C	0.003	<0.003	mg/L	
	2-Methylphenol	8270 C	0.003	<0.003	mg/L	
	Hexachloroethane	8270 C	0.003	<0.003	mg/L	
	N-Nitroso-di-n-dipropylamine	8270 C	0.003	<0.003	mg/L	
	4-Methylphenol	8270 C	0.003	<0.003	mg/L	
	Nitrobenzene	8270 C	0.003	<0.003	mg/L	
	Isophorone	8270 C	0.003	<0.003	mg/L	
	2-Nitrophenol	8270 C	0.003	<0.003	mg/L	
	2,4-Dimethylphenol	8270 C	0.003	<0.003	mg/L	
	Bis(2-Chloroethoxy) methane	8270 C	0.003	<0.003	mg/L	
	2,4-Dichlorophenol	8270 C	0.003	<0.003	mg/L	
	1,2,4-Trichlorobenzene	8270 C	0.003	<0.003	mg/L	
	Naphthalene	8270 C	0.003	<0.003	mg/L	
	2,6-Dichlorophenol	8270 C	0.003	<0.003	mg/L	
	Hexachlorobutadiene	8270 C	0.003	<0.003	mg/L	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
	4-Chloro-3-methylphenol	8270 C	0.003	<0.003	mg/L	
	1,2,4,5-Tetrachlorobenzene	8270 C	0.003	<0.003	mg/L	
	Hexachlorocyclopentadiene	8270 C	0.006	<0.006	mg/L	
	2,4,6-Trichlorophenol	8270 C	0.003	<0.003	mg/L	
	2,4,5-Trichlorophenol	8270 C	0.003	<0.003	mg/L	
	2-Chloronaphthalene	8270 C	0.003	<0.003	mg/L	
	Acenaphthylene	8270 C	0.003	<0.003	mg/L	
	Dimethylphthalate	8270 C	0.003	<0.003	mg/L	
	2,6-Dinitrotoluene	8270 C	0.003	<0.003	mg/L	
	Acenaphthene	8270 C	0.003	**0.014**	mg/L	
	2,4-Dinitrophenol	8270 C	0.013	<0.013	mg/L	
	Dibenzofuran	8270 C	0.003	<0.003	mg/L	
	2,4-Dinitrotoluene	8270 C	0.003	<0.003	mg/L	
	2,3,5,6-Tetrachlorophenol	8270 C	0.003	<0.003	mg/L	
	2,3,4,6-Tetrachlorophenol	8270 C	0.003	<0.003	mg/L	
	Fluorene	8270 C	0.003	**0.003**	mg/L	
	Diethylphthalate	8270 C	0.003	<0.003	mg/L	
	4,6-Dinitro-2-methylphenol	8270 C	0.006	<0.006	mg/L	
	N-Nitrosodiphenylamine	8270 C	0.003	<0.003	mg/L	
	4-Bromophenyl phenyl ether	8270 C	0.003	<0.003	mg/L	
	alpha-BHC	8270 C	0.003	<0.003	mg/L	
	Hexachlorobenzene	8270 C	0.003	<0.003	mg/L	
	Pentachlorophenol	8270 C	0.006	<0.006	mg/L	
	beta-BHC	8270 C	0.003	<0.003	mg/L	
	gamma-BHC (Lindane)	8270 C	0.003	<0.003	mg/L	
	Phenanthrene	8270 C	0.003	<0.003	mg/L	
	Anthracene	8270 C	0.003	<0.003	mg/L	
	delta-BHC	8270 C	0.003	<0.003	mg/L	
	Heptachlor	8270 C	0.003	<0.003	mg/L	
	di-n-Butylphthalate	8270 C	0.003	<0.003	mg/L	
	Aldrin	8270 C	0.003	<0.003	mg/L	
	Heptachlor epoxide	8270 C	0.006	<0.006	mg/L	
	Fluoranthene	8270 C	0.003	<0.003	mg/L	
	Pyrene	8270 C	0.003	<0.003	mg/L	
	Endosulfan I	8270 C	0.006	<0.006	mg/L	
	trans-Nonachlor	8270 C	0.003	<0.003	mg/L	
	Dieldrin	8270 C	0.003	<0.003	mg/L	
	p,p`-DDE	8270 C	0.003	<0.003	mg/L	
	Endrin	8270 C	0.006	<0.006	mg/L	
	Endosulfan II	8270 C	0.006	<0.006	mg/L	
	p,p`-DDD	8270 C	0.003	<0.003	mg/L	
	Butylbenzylphthalate	8270 C	0.003	<0.003	mg/L	
	Endosulfan sulfate	8270 C	0.006	<0.006	mg/L	
	p,p`-DDT	8270 C	0.003	<0.003	mg/L	
	Bis(2-ethylhexyl)adipate	8270 C	0.003	<0.003	mg/L	
	Benzo(a)anthracene	8270 C	0.003	<0.003	mg/L	
	Chrysene	8270 C	0.003	<0.003	mg/L	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
	Bis(2-ethylhexyl)phthalate	8270 C	0.003	<0.003	mg/L	
	Di-n-octylphthalate	8270 C	0.003	<0.003	mg/L	
	Benzo(b)fluoranthene	8270 C	0.003	<0.003	mg/L	
	Benzo(k)fluoranthene	8270 C	0.003	<0.003	mg/L	
	Benzo(a)pyrene	8270 C	0.003	<0.003	mg/L	
	Indeno(1,2,3,c,d)pyrene	8270 C	0.003	<0.003	mg/L	
	Tentatively Identified Compound	8270 C		**None Detected**	mg/L	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
002	**10000 - Sediment below outfall, 8/9/2002 11:10**					
Polynuclear Aromatic Hydrocarbons by GC/MS SIM						
	Naphthalene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Acenaphthylene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Acenaphthene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Dibenzofuran	8270 SIM	0.025	<0.025	mg/Kg dry	
	Fluorene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Dibenzothiophene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Phenanthrene	8270 SIM	0.025	**0.033**	mg/Kg dry	
	Anthracene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Fluoranthene	8270 SIM	0.025	**0.080**	mg/Kg dry	
	Pyrene	8270 SIM	0.025	**0.096**	mg/Kg dry	
	Benzo[a]anthracene	8270 SIM	0.025	**0.042**	mg/Kg dry	
	Chrysene	8270 SIM	0.025	**0.055**	mg/Kg dry	
	Benzo[b]fluoranthene	8270 SIM	0.025	**0.123**	mg/Kg dry	
	Benzo[k]fluoranthene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Benzo(a)pyrene	8270 SIM	0.025	**0.068**	mg/Kg dry	
	Perylene	8270 SIM	0.025	**0.026**	mg/Kg dry	
	Indeno[1,2,3-cd]pyrene	8270 SIM	0.025	**0.039**	mg/Kg dry	
	Dibenz[a,h]anthracene	8270 SIM	0.025	<0.025	mg/Kg dry	
	Benzo[ghi]perylene	8270 SIM	0.025	**0.056**	mg/Kg dry	
Semi-volatile Organic Compounds by GC/MS						
	Phenol	8270 C	0.3	<0.3	mg/Kg dry	
	Bis(2-Chloroethyl) ether	8270 C	0.3	<0.3	mg/Kg dry	
	Dibenzo(a,h)anthracene	8270 C	0.3	<0.3	mg/Kg dry	
	Benzo(g,h,i)perylene	8270 C	0.3	<0.3	mg/Kg dry	
	2-Chlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	1,3-Dichlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	1,4-Dichlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	1,2-Dichlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	Bis(2-Chloroisopropyl) ether	8270 C	0.3	<0.3	mg/Kg dry	
	2-Methylphenol	8270 C	0.3	<0.3	mg/Kg dry	
	Hexachloroethane	8270 C	0.3	<0.3	mg/Kg dry	
	N-Nitroso-di-n-dipropylamine	8270 C	0.3	<0.3	mg/Kg dry	
	4-Methylphenol	8270 C	0.3	<0.3	mg/Kg dry	
	Nitrobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	Isophorone	8270 C	0.3	<0.3	mg/Kg dry	
	2-Nitrophenol	8270 C	0.3	<0.3	mg/Kg dry	
	2,4-Dimethylphenol	8270 C	0.3	<0.3	mg/Kg dry	
	Bis(2-Chloroethoxy) methane	8270 C	0.3	<0.3	mg/Kg dry	
	2,4-Dichlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	1,2,4-Trichlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	Naphthalene	8270 C	0.3	<0.3	mg/Kg dry	
	2,6-Dichlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	Hexachlorobutadiene	8270 C	0.3	<0.3	mg/Kg dry	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
	4-Chloro-3-methylphenol	8270 C	0.3	<0.3	mg/Kg dry	
	1,2,4,5-Tetrachlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	Hexachlorocyclopentadiene	8270 C	0.3	<0.3	mg/Kg dry	
	2,4,6-Trichlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	2,4,5-Trichlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	2-Chloronaphthalene	8270 C	0.3	<0.3	mg/Kg dry	
	Acenaphthylene	8270 C	0.3	<0.3	mg/Kg dry	
	Dimethylphthalate	8270 C	0.3	<0.3	mg/Kg dry	
	2,6-Dinitrotoluene	8270 C	0.3	<0.3	mg/Kg dry	
	Acenaphthene	8270 C	0.3	<0.3	mg/Kg dry	
	2,4-Dinitrophenol	8270 C	0.3	<0.3	mg/Kg dry	
	Dibenzofuran	8270 C	0.3	<0.3	mg/Kg dry	
	2,4-Dinitrotoluene	8270 C	0.3	<0.3	mg/Kg dry	
	2,3,5,6-Tetrachlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	2,3,4,6-Tetrachlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	Fluorene	8270 C	0.3	<0.3	mg/Kg dry	
	Diethylphthalate	8270 C	0.3	<0.3	mg/Kg dry	
	4,6-Dinitro-2-methylphenol	8270 C	0.3	<0.3	mg/Kg dry	
	N-Nitrosodiphenylamine	8270 C	0.3	<0.3	mg/Kg dry	
	4-Bromophenyl phenyl ether	8270 C	0.3	<0.3	mg/Kg dry	
	alpha-BHC	8270 C	0.3	<0.3	mg/Kg dry	
	Hexachlorobenzene	8270 C	0.3	<0.3	mg/Kg dry	
	Pentachlorophenol	8270 C	0.3	<0.3	mg/Kg dry	
	beta-BHC	8270 C	0.3	<0.3	mg/Kg dry	
	gamma-BHC (Lindane)	8270 C	0.3	<0.3	mg/Kg dry	
	Phenanthrene	8270 C	0.3	<0.3	mg/Kg dry	
	Anthracene	8270 C	0.3	<0.3	mg/Kg dry	
	delta-BHC	8270 C	0.3	<0.3	mg/Kg dry	
	Heptachlor	8270 C	0.3	<0.3	mg/Kg dry	
	di-n-Butylphthalate	8270 C	0.3	**0.7**	mg/Kg dry	
	Aldrin	8270 C	0.3	<0.3	mg/Kg dry	
	Heptachlor epoxide	8270 C	0.3	<0.3	mg/Kg dry	
	Fluoranthene	8270 C	0.3	<0.3	mg/Kg dry	
	Pyrene	8270 C	0.3	<0.3	mg/Kg dry	
	Endosulfan I	8270 C	0.3	<0.3	mg/Kg dry	
	trans-Nonachlor	8270 C	0.3	<0.3	mg/Kg dry	
	Dieldrin	8270 C	0.3	<0.3	mg/Kg dry	
	p,p`-DDE	8270 C	0.3	<0.3	mg/Kg dry	
	Endrin	8270 C	0.3	<0.3	mg/Kg dry	
	Endosulfan II	200.13	0.3	<0.3	mg/Kg dry	
	p,p`-DDD	8270 C	0.3	<0.3	mg/Kg dry	
	Butylbenzylphthalate	8270 C	0.3	<0.3	mg/Kg dry	
	Endosulfan sulfate	8270 C	0.3	<0.3	mg/Kg dry	
	p,p`-DDT	8270 C	0.3	<0.3	mg/Kg dry	
	Bis(2-ethylhexyl)adipate	8270 C	0.3	<0.3	mg/Kg dry	
	Benzo(a)anthracene	8270 C	0.3	<0.3	mg/Kg dry	
	Chrysene	8270 C	0.3	<0.3	mg/Kg dry	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Item #	Test	Method	Reporting Limit	Result	Units	Notes
	Bis(2-ethylhexyl)phthalate	8270 C	0.3	**0.5**	mg/Kg dry	
	Di-n-octylphthalate	8270 C	0.3	<0.3	mg/Kg dry	
	Benzo(b)fluoranthene	8270 C	0.3	<0.3	mg/Kg dry	
	Benzo(k)fluoranthene	8270 C	0.3	<0.3	mg/Kg dry	
	Benzo(a)pyrene	8270 C	0.3	<0.3	mg/Kg dry	
	Indeno(1,2,3,c,d)pyrene	8270 C	0.3	<0.3	mg/Kg dry	
	Tentatively Identified Compound	8270 C		**None Detected**	mg/Kg dry	

Sampling Event: 20020870 OUTFALL 22-C

Fund Code: 23715 Wacker Siltronic RI

Notes

#	Note

Request for Analysis

LEGAL

Case No. [illegible]

Location/Site: OUTFALL 22-C (N. SIDE OF BNSF RR BRIDGE)

Date Sampled: AUGUST 9, 2002

Date Received in Lab: 8/9/02

Collected by: MATT McCLINCY ERIC BLISCHKE

Fund Code: 940101 TAS-15040 23715

Date Reported: OCT 16 2002

Purpose: EVALUATE ORGANICS ASSOCIATED W/ OUTFALL DISCHARGE

Report Data to: ERIC BLISCHKE (503) 229-5648

Comments:

Item #	Sampling Point Description (include time)	Sample container according to test(s) requested: Nutrients / Basic	DO / BOD	Metals / Organic	Misc. / Misc.	Test(s) Required
1	STREAM BELOW OUTFALL SURFACE WATER B03730B 11:00AM B03730A					~~SVOC (8270)~~ GB 8/9/02 VOC (8260)
2	SEDIMENT BELOW OUTFALL 11:10 AM SD-01 (4 4 OZ. JARS)					SVOC (8270) SIM PAHs VOC (8260)
3	STREAM BELOW OUTFALL SURFACE WATER X008238 11:00AM X008242					SVOC (8270) SIM PAHS
4	TRIP BLANK B00532B B00532A					VOC (8260)
5						
6						

Laboratory Comments:

Contact Sample Tracker for proper sampling containers and preservation procedure. (503) 229-5983

SCOEPA00011033

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

July 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

HAI Project No. 5237

SUBJECT: June 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of June 2003. RI field activities for the site are being conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan (RI Work Plan), as well as the approved Supplemental RI Work Plan. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in June 2003

During June 2003, NW Natural worked on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. No further RI activities related to the Wacker property were conducted by NW Natural during the month of June.

Anticipated / Completed Activities in July and August 2003

The only remaining RI data collection task to be completed by NW Natural at the site involves an inspection and elevation survey of the drainage ditch located on Burlington Northern Santa Fe Railway (BNSF) property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

434 NW 6th AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3651
503-796-0717 Telephone • 503-227-2209 Facsimile

In correspondence dated July 7, 2003 (Mr. Matt McClincy to Mr. Bob Wyatt), DEQ provides reference to investigation activities associated with the off-site BNSF drainage ditch that were conducted by AMEC Earth and Environmental, Inc. (AMEC) as part of the adjacent Rhone-Poulenc facility RI. These investigation activities apparently included evaluation activities similar to those proposed by NW Natural (see above), in addition to limited surface water testing within a portion of the drainage ditch. Based on AMEC's findings, the DEQ has requested NW Natural prepare an updated proposal for evaluating Wacker site-related impacts to the Willamette River via discharges from the off-site drainage ditch. DEQ has requested this proposal be provided by August 7, 2003. NW Natural will review the applicable Rhone-Poulenc reports and will follow-up with DEQ in the near future.

In addition to the preceding, because it remains unclear when legal access to the off-site drainage ditch may be available, the DEQ has requested that results of drainage ditch-related investigatory activities be reported separately from the other, already completed investigatory activities. NW Natural is evaluating this request and will respond to it directly under a separate correspondence.

NW Natural understands that work plans and results of Wacker's own trichloroethene-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
CENTRAL ENGINEERING

Wacker Siltronic Corporation
7200 N.W. Front Avenue, MS 30
Portland, OR 97210-3676, USA
Tel. 503-219-7406
Fax 503-219-7599
cathryn_young@siltronic.com

FAX

July 17, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

3 Page(s) incl. coversheet

Re: HAI June 2003 Progress Report

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

July 7, 2003

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Re: Status of Focused Remedial Investigation on the Wacker Siltronic Corporation Site
ECSI No. 183

Dear Mr. Wyatt:

I have recently completed a review of the focused remedial investigation (RI) Northwest Natural is performing on the Wacker Siltronics Site as part of my efforts to come up to speed on the project. This letter summarizes the Oregon Department of Environmental Quality (DEQ) position on the status of this work along with comments regarding the schedule and elements to be considered in the pending Technical Memorandum on Source Control Measures.

Off-Site Ditch Evaluation

The June 1, 2001 Focused Remedial Investigation Work Plan requires Northwest Natural to ascertain the potential occurrence of contaminant migration in groundwater from the Wacker Site to the adjacent off-site drainage ditch near the southern and western property boundaries. Northwest Natural proposed to accomplish this by visually inspecting the drainage ditch for groundwater seeps, surveying the elevation of the ditch and comparing the ditch elevation to groundwater surface elevations. The work plan indicates that Northwest Natural will develop and provide DEQ options regarding a sampling scheme of sufficient scope to allow determination of site-related impacts to the Willamette River via the ditch if it is determined there is potential for groundwater discharge to the ditch. As noted in monthly project progress reports submitted on behalf of Northwest Natural by Hahn and Associates, Inc., Northwest Natural has been unable to obtain approval from Burlington Northern Santa Fe Railway (BNSF) to access the property to perform the proposed drainage ditch assessment.

The RI of the adjacent Rhone-Poulenc facility has included the southern portion of the drainage ditch. The drainage ditch feeds the Northwest Drainage Pond (NDP) which drains to an 84 inch concrete pipe that discharges to the Willamette River at City Outfall 22C. The Rhone-Poulenc RI work surveyed the water elevation in the NDP and compared it to groundwater elevations measured in the adjacent monitoring wells. In a recent groundwater characterization report[1],

[1] AMEC, March 28, 2003, "Final Groundwater Characterization Report RPAC – Portland Site"

AMEC Earth & Environmental, Inc. concluded that groundwater discharges to the NDP year-round. Surface water samples from the NDP and outfall 22C were collected and tested as part of the Rhone-Poulenc RI. Laboratory results[2] detected contaminants typically associated with GASCO waste (e.g., benzene, toluene, polynuclear aromatic hydrocarbons, and dibenzofuran). Based on this information, DEQ concludes that the drainage ditch provides a complete pathway to the Willamette River for groundwater contaminants from the Wacker Site. As a result, DEQ is requiring that Northwest Natural provide a proposal, within 30 days of receipt of this letter, to determine if contaminants from the Wacker Site are impacting, or have the potential to impact, the Willamette River and sediments via the drainage ditch.

It is anticipated that access to BNSF property to survey the drainage ditch and to implement the requested evaluation will still be required. As such, it is important that Northwest Natural obtain access to the BNSF property in a timely manner. It appears that progress regarding the access agreement is being made based on our recent discussions. Please continue to keep DEQ informed as to the status of access to the BNSF property.

Phase I Site Characteristic Summary Report

Northwest Natural should proceed with the preparation of the Phase I Site Characteristic Summary Report and provide it to the DEQ within the next 90 days. Future investigation of the drainage ditch can be provided to DEQ either as a separate document or as part of the Technical Memorandum on Source Control Measures.

Source Control Evaluation

The schedule for the submittal of the Technical Memorandum on Source Control Measures should be revised to allow for consideration of the results of TCE groundwater assessment work that will be implemented by Wacker under their DEQ approved work plan dated June 10, 2003 and potentially the results of the expanded assessment of the drainage ditch requested in this letter.

The June 1, 2001 Focused Remedial Investigation Work Plan specified construction of a well cluster (i.e., two monitoring wells) in the central portion of the site. This well cluster has not yet been constructed. The pending TCE groundwater assessment may fill this data gap, and at a minimum will provide more data on contaminant distribution in site groundwater.

DEQ is also aware that the City of Portland has completed a relatively detailed sediment study at outfall 22C, and DEQ anticipates receipt of this data in the near future. This data should be considered in the drainage ditch evaluation if the schedule permits. DEQ will keep you appraised on the status of this data.

Field evidence of hazardous substances has been observed in a number of the borings on the Wacker Site. This information, from both recent and past boring logs, should be summarized on

[2] AMEC, February 4, 2003, "Remaining Remedial Investigation Technical Memorandum RPAC – Portland Site"

a site figure and appropriate cross-sections and incorporated into the conceptual model presented in the Source Control Memorandum.

Please contact me at (503) 229-5538 if you have any questions or would like to schedule a meeting to discuss options for investigation of the drainage ditch.

Sincerely,

Matt McClincy

Matt McClincy
Project Manager
Cleanup & Portland Harbor

cc: Michael E. Rosen, DEQ NWR
Rod Struck, DEQ NWR
Rob Ede, Hahn & Associates
Tom Schadt, Anchor Environmental
Cathryn Young, Wacker Siltronic
Jim Maul, MFA

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

July 7, 2003

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

RE: DEQ Oversight Charges Related to DEQ Order No. ECVC-NWR-00-27

Dear Bob and Cathyrn:

The purpose of this letter is to clarify the Oregon Department of Environmental Quality (DEQ) separation of oversight charges related to DEQ Order No. ECVC-NWR-00-27 for investigation performed on the Wacker Siltronic Property.

DEQ charges associated with the administration and oversight of the Trichloroethene (TCE) remedial investigation are currently being tracked and invoiced to Wacker Siltronic Corporation. This arrangement was proposed by DEQ and agreed to by Wacker Siltronic Corporation. DEQ anticipates that it will enter a more formal administrative instrument with Wacker in the near future that addresses the TCE remedial investigation.

DEQ is invoicing non TCE-related costs associated with the remedial investigation and source control measures required by the Order to Northwest Natural.

Please contact me at (503) 229-5538 if you have any questions.

Sincerely,

Matt McClincy
Project Manager
Cleanup & Portland Harbor

cc: Patricia Dost, Schwabe Williamson & Wyatt
Chris Reive, Tarlow Jordan & Schrader

Oregon
Theodore R. Kulongoski, Governor

Department of Environmental Quality
Northwest Region Portland Office
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June 16, 2003

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: DEQ Oversight Invoices for Wacker Siltronic RI Project
ECSI No. 183

Dear Cathryn:

Thank you for bringing to my attention DEQ oversight costs that you believe are not attributable to the TCE investigation at the Wacker site. After reviewing the disputed charges identified in your June 6, 2003 letter, the following determinations were made.

- DEQ oversight costs dated: 8/09/02, 10/01/02, 10/02/02, 10/28/02, 11/26/02, 12/16/02, 12/17/02, 12/18/02, 1/29/03 and 2/23/03 relate to work conducted regarding GASCO waste on the Wacker site and will be invoiced to NW Natural.
- The 5/28/03 charge from the Attorney General and the 4/01/03 charge to meet with the Oregon Department of Justice relate to the administration of work on the Wacker site for the investigation of both TCE and GASCO waste. Consequently, DEQ will split the charges evenly and invoice NW Natural and Wacker separately.
- Although the 2.75 hours of staff time cumulatively charged on 1/16/03, 3/17/03, 3/19/03, 4/14/03, 4/15/03 and 4/21/03 arguably relate to the administration of TCE-related activities, DEQ agrees to waive these charges.

DEQ will update the project invoices in accordance with these findings. Please contact me at (503) 229-5538 if you continue to have questions regarding this matter.

Sincerely,

Matt McClincy

Matt McClincy
Project Manager
Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Norm King, Business Office/DEQ
Bob Wyatt, NW Natural

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

June 13, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: May 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of May 2003. RI field activities for the site are being conducted as per the approved Final Focused Remedial Investigation (RI) Work Plan (RI Work Plan), as well as the approved Supplemental RI Work Plan. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in May 2003

During May 2003, NW Natural worked on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. With the exception of inquiring as to site access, as described below, no further RI activities related to the Wacker property were conducted by NW Natural during the month of May.

Anticipated / Completed Activities in June and July 2003

The only remaining RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on Burlington Northern Santa Fe Railway (BNSF) property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF. To date, NW Natural has had no

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response from representatives of BNSF. A new letter of inquiry regarding the status of NW Natural's request for site access, prepared by Ms. Patty Dost of Schwabe, Williamson & Wyatt, P.C., was transmitted to representatives of BNSF on May 29, 2003. NW Natural has yet to receive a response.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the DEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
CENTRAL ENGINEERING

Wacker Siltronic Corporation
7200 N.W. Front Avenue, MS 30
Portland, OR 97210-3676, USA
Tel. 503-219-7406
Fax 503-219-7599
cathryn_young@siltronic.com

FAX

June 16, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

3 Page(s) incl. coversheet

Re: HAI May 2003 Progress Report

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

May 15, 2003

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region, Portland Office
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: April 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. McClincy:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of May 2003. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in April 2003

During April 2003, NW Natural worked on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. With the exception of inquiring as to site access, as described below, no further RI activities related to the Wacker property were conducted by NW Natural during the month of April.

Anticipated / Completed Activities in May and June 2003

The only remaining RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on Burlington Northern Santa Fe Railway (BNSF) property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF. To date, NW Natural has had no response from representatives of BNSF. A letter of inquiry regarding the status of NW Natural's

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[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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request for site access, prepared by Ms. Patty Dost of Schwabe, Williamson & Wyatt, P.C., was transmitted to representatives of BNSF on March 18, 2003. NW Natural has yet to receive a response. Ms. Dost will transmit another letter of inquiry to BNSF's representatives during May 2003.

A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
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cathryn_young@siltronic.com

FAX

May 19, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

3 Page(s) incl. coversheet

HAI letter of May 15, 2003: April 2003 Progress Report

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*** TX REPORT ***
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WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
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cathryn_young@siltronic.com

FAX

May 19, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

3 Page(s) incl. coversheet

HAI letter of May 15, 2003: April 2003 Progress Report

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

March 14, 2003

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: February 2003 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of February 2003. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in February 2003

During February 2003, NW Natural worked on development of the Phase I Site Characterization RI Summary Report and Source Control Evaluation documenting investigatory activities completed by NW Natural as part of RI activities completed to date. With the exception of awaiting site access, as described below, no further RI activities related to the Wacker property were conducted by NW Natural during the month of February.

Anticipated / Completed Activities in March and April 2003

The only remaining RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

WACKER SILTRONIC

CATHRYN YOUNG
SENIOR MANAGER
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FAX

March 20, 2003

To Chris Reive
Jordan Schrader

From Cathryn Young

Fax 503-598-7373

3 Page(s) incl. coversheet

HAI letter of March 14, 2003
February 2003 Progress Report

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

December 16, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW Fourth Avenue, Suite 400
Portland OR 97201-4987

HAI Project No. 5237

SUBJECT: November 2002 Progress Report for Remedial Investigation (RI) Activities, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) has prepared this Progress Report summarizing RI work activities conducted by NW Natural that have occurred relating to the Wacker Siltronic Corporation (Wacker) property during the month of November 2002. RI field activities for the site are being conducted as per the approved *Final Focused Remedial Investigation (RI) Work Plan*[1] (RI Work Plan), as well as the approved *Supplemental RI Work Plan* [2]. This Progress Report has been prepared as per an Order (DEQ No. ECVC-NWR-00-27) issued jointly to both NW Natural and Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. As per the referenced Order, monthly progress reports are to be prepared by the 15th day of each month, with the reporting to continue for the duration of the project.

Summary of Activities in November 2002

With the exception of awaiting site access, as described below, NW Natural conducted no RI activities related to the Wacker property during the month of November.

Anticipated / Completed Activities in December 2002 and January 2003

The only remaining Phase I RI data collection task to be completed at the site involves an inspection and survey of the base of the drainage ditch located on BNSF property immediately west and south of the Wacker property. Initiation of this task will require receipt of access approval from BNSF, the owner of the right-of-way through which the ditch runs. A proposed access agreement has been reviewed and approved by NW Natural. NW Natural is presently awaiting approval and execution of the access agreement by BNSF.

---

[1] Hahn and Associates, Inc. (2001). *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1, 2001.

[2] Hahn and Associates, Inc. (2002). *Supplemental Remedial Investigation Work Plan, Wacker Siltronic Corporation,, 7200 NW Front Avenue, Portland, Oregon.* March 7, 2002.

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A full reporting and evaluation of the results of NW Natural's investigatory activities will be included within the Phase I Site Characterization Summary Report and the Technical Memorandum on Source Control Measures, both of which are due to the ODEQ within 90 days after completion of the Phase I RI activities.

NW Natural understands that work plans and results of Wacker's own TCE-related investigation activities will be documented by Wacker and will be submitted independently by them to the DEQ.

Should you have any questions, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

rede@hahnasoc.com

c: Mr. Bob Wyatt, NW Natural
Ms. Patty Dost, Schwabe, Williamson & Wyatt
Mr. Carl Stivers, Anchor Environmental, L.L.C.
Ms. Cathryn Young, Wacker Siltronic Corporation

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

August 20, 2002

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW 4th Avenue, Suite 400
Portland Oregon 97201-4987

HAI Project No. 5237

SUBJECT: Data Validation and Data Quality Assessment, Soil and Water Data, Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon

Dear Mr. Blischke:

Hahn and Associates, Inc. (HAI) provided all soil, surface water, and push probe-related groundwater data generated as part of Focused Remedial Investigation activities completed at the above-referenced property to Ms. Kathy Gunderson, a validation chemist, for completion of a U.S. Environmental Protection Agency (EPA) Level III validation. Results of Ms. Gunderson's validation are provided within the enclosed *Data Validation and Data Quality Assessment Report*, dated June 11, 2002.

As detailed in the enclosed report, the validation was performed in accordance with the procedures established in the *Contract Laboratory Program National Functional Guidelines for Inorganic and Organic Data Review* (Functional Guidelines) (USEPA 1994 and 1994a). Data quality objectives, project detection limits, and QC sample frequencies are from the *Focused Remedial Instigation Sampling and Analysis Plan, Wacker Siltronic Corporation Property* (Hahn and Associates 2001). The criteria used to qualify data are from Functional Guidelines, the Work Plan, the analytical methods, or the professional judgment of the validation chemist.

As provided in the enclosed report, no data were disqualified as a result of the validation review. Limited data were qualified as being "estimated" due to specific quality control exceedances. Soil and Water Results Summary Tables, qualified as per results of the data validation review, are enclosed as Appendix B to the report.

Based on review of the results of the data validation, it is concluded that all reviewed soil and water data are of sufficient quality to support the pending source control evaluation activities for the site.

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If you have any questions regarding the enclosed report, please contact the undersigned.

Sincerely,

Robert Ede, R.G.
Associate

Enclosures (4)

c: Mr. Bob Wyatt, NW Natural, w/out enclosure
Ms. Patty Dost, Schwabe, Williamson, & Wyatt , w/out enclosure
Mr. Carl Stivers, Anchor Environmental LLC
Ms. Cathryn Young, Wacker Siltronic Corporation

PHASE I REMEDIAL INVESTIGATION SUMMARY REPORT AND PRELIMINARY ANALYSIS OF SOIL DATA (As Appendix 1)

Volume 1

Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

October 9, 1998

Prepared for:

Northwest Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

and

Decision Management Associates LLC
Portland, Oregon
(Appendix 1)

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HAI Project No. 2708

PHASE I REMEDIAL INVESTIGATION SUMMARY REPORT AND PRELIMINARY ANALYSIS OF SOIL DATA

Northwest Natural
Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

October 9, 1998

1. PURPOSE

The purpose of this report is to provide a summary and analysis of existing data collected as part of Phase I Remedial Investigation (RI) activities at the Gasco site to assist in the understanding of the site, and to guide decisions regarding additional data acquisition.

As the overall goals of RI activities are to characterize site conditions, provide for an evaluation of the risks to human health and the environment posed by the site, and to provide the basis for the identification and implementation of appropriate remedial actions based on those risks, the following investigatory objectives exist.

- To confirm the contaminants of concern at the site
- To determine the affected media at the site
- To characterize the nature and extent of the contaminants of concern in the affected media at the site
- To identify and characterize migration pathways for contaminants of concern
- To assess the risks to human health and the environment posed by the presence of contaminants of concern in the affected media
- To obtain information that can be utilized in a feasibility study to select appropriate remedial actions(s).

2. SITE DESCRIPTION

The Gasco site comprises approximately 47 acres in the North Doane Lake area of Portland and is bounded by St. Helens Road to the southwest, the Willamette River to the northeast, and industrial properties to the northwest and southeast (Figures 1 and 2). The ground surface at the site slopes gradually northeastward towards the Willamette River with

surface elevations ranging from approximately 38 feet above mean sea level (msl-City of Portland datum) at the southwestern portion of the property to approximately 23 to 30 feet msl at the top of the river bank. The river bank, composed primarily of rip rap, slopes steeply to an elevation of approximately 5 to 8 feet msl, below which exists the shoreline with a more gradual slope. Average monthly river stages, as measured at the Portland Harbor from 1973 to 1990 and converted to the City of Portland datum, range from a low of approximately 6.3 feet msl during August and September, to a high of 10.9 feet msl during May and June (COE, 1991).

The Gasco site was the former location of the Portland Gas and Coke Company manufactured gas plant oil gasification facility from 1913 to 1956. Manufacturing processes at the site have involved the generation of town gas and pressed lampblack briquettes, aromatic generation and light oil recovery, tar recovery and refining, and the production of electrode grade coke and high Btu gas (Camp Dresser & McKee, Inc., 1987) Northwest Natural began construction of the liquefied natural gas (LNG) plant at the site in the late 1960's, at which time a majority of the old gasification plant facilities were demolished.

With regard to other uses of the property, Koppers operated a coal tar pitch manufacturing facility at the southern portion of the former gasification facility from 1966 to 1973. Koppers currently uses the facility as a terminal for the distribution of creosote oils.

Pacific Northern Oil (PNO) has operated a fuel storage and distribution facility at the northern portion of the site from the 1960's to the present.

The locations of former structures and features associated with the former manufactured gas plant, as well as current structures associated with the Northwest Natural, Koppers and PNO facilities, are shown on Figure 3.

3. EXISTING DATA AND DOCUMENTS

Northwest Natural and the Oregon Department of Environmental Quality (DEQ) entered into an Agreement for the completion of a Remedial Investigation/Feasibility Study (DEQ Agreement No. ECVC-WMCVC-NWR-94-13) for the Gasco site in 1994. RI activities were subsequently implemented by Northwest Natural at the Gasco site in September 1995, with investigatory activities being implemented by Hahn and Associates, Inc. (HAI) as provided within the approved RI Work Plan (HAI, 1995). RI activities conducted at the site to date are briefly summarized below.

3.1 Scope

The scope of work for the Phase I RI activities performed by Northwest Natural from September 1995 to the present include the following tasks (see Figure 4, Sample Location Map):

- Installation of 54 soil borings and well borings (B, G, GT, and MW-series), with the collection and analysis of soil samples
- Collection and analysis of groundwater samples from 7 temporary well point installations
- Installation of 18 groundwater monitoring wells with 8 rounds of sampling from the wells
- Twelve monthly groundwater level monitoring events and 7 subsequent quarterly events
- Installation of 11 vibra cores in the Willamette River with the collection and analysis of sediment samples
- Collection of 5 surface water and sediment samples from on-site ponds and a drainage ditch
- Collection of air and dust samples
- One 48-hour water level monitoring test
- Monitoring well slug test data collection and analysis
- Surface geophysical survey in area of former Tar Ponds with ground penetrating radar, magnetic, and electromagnetic methods

3.2 Previous Document Submittals

Results of Phase I RI activities at the Gasco site have been documented in numerous reports. The documents that provide the most comprehensive synthesis of available site data and data interpretation concerning RI investigatory results are as follows:

- Hahn and Associates, Inc., *Data Package for Remedial Investigation / Feasibility Study, Northwest Natural Gas Company, Gasco Facility,* July 22, 1996
- Hahn and Associates, Inc., *Geological and Hydrogeological Framework, Northwest Natural Gas Company, Gasco Facility,* May 13, 1997
- Hahn and Associates, Inc., *Monitoring Well Abandonment and Installation Activities, Northwest Natural Gas Company, Gasco Facility,* February 19, 1998

- Hahn and Associates, Inc., *Fourth Quarter 1997 Progress Report for Remedial Investigation / Feasibility Study Activities, Northwest Natural Gas Company, Gasco Facility,* February 23, 1998

- Hahn and Associates, Inc., *Second Quarter 1998 Progress Report for Remedial Investigation / Feasibility Study Activities, Northwest Natural Gas Company, Gasco Facility,* April 24, 1998

In addition to the above reports documenting Phase I RI results, the following are the primary documents that have been prepared to date in support of Risk Assessment activities for the Gasco site:

- Stoel Rives LLP, *Current and Reasonably Anticipated Future Land and Beneficial Water Uses in the Locality of the Facility, Northwest Natural Gas Gasco Facility*, April 1997

- Decision Management Associates and Montgomery Watson, *Data Summary and Exposure Pathway Analysis Technical Memorandum, Gasco Risk Assessment*, May 15, 1997

- Decision Management Associates and Montgomery Watson, *Comparison Between McCormick and Baxter Site and Gasco Site Technical Memorandum, Gasco Risk Assessment*, June 11, 1997

- Decision Management Associates and Montgomery Watson, *Exposure Assessment, Gasco Risk Assessment*, July 2, 1997

- Hahn and Associates, Inc., *Locality of Facility, Northwest Natural Gas Company, Gasco Facility,* August 1, 1997 (A Beneficial Use determination support document)

- Decision Management Associates and Montgomery Watson, *Toxicity Assessment, Gasco Risk Assessment*, December 16, 1997

3.3 Summary of Available Data

A general description of available RI data for the Gasco site, including identification of where this data may be found, is provided in the following Sections.

3.3.1 Soil Data

The majority of soil quality and lithologic data for the Site were collected from September 1995 to January 1996 during which time soil borings B-1 through B-35, MW-1 through MW-12, and M-11 were installed. More recently, soil quality data, geotechnical soil borings G-

1 and G-2 were installed by GeoEngineers, Inc. within the Koppers lease area in April 1997, geotechnical soil borings GT-1 through GT-4 were installed by GeoEngineers, Inc. within the PNO tank farm area in November 1997, and well boring MW-13 was installed down-gradient of MW-6 (PNO lease area) in December 1997.

For reference herein, a figure depicting all soil boring locations, as well as a summary of available soil quality data collected at the site to date, are included within Appendix G, and soil boring logs depicting lithologic and contaminant conditions at each boring location are provided within Appendices A (soil borings) and B (monitoring well borings).

3.3.2 Willamette River Sediment Data

Fourteen sediment core samples (SD-1 through SD-14) were collected by Northwest Natural from the Willamette River adjacent to, and up-stream of, the Gasco site in January 1996. With regard to additional sediment quality investigatory activities conducted in the vicinity of the site, The U.S. Environmental Protection Agency (EPA) conducted a Site Inspection (SI) of a six-mile reach of the Willamette River in September and October 1997, including the collection of sediment samples adjacent to the Gasco site (Weston, 1998). Also, several sediment studies involving the vicinity of the Gasco site have been undertaken by the U.S Army Corps of Engineers (COE). Specifically, in 1989 and 1994 the COE conducted sediment studies within the dock area at the U.S. Moorings Station, located adjacent to, and down-river of, the Gasco site (Britton, 1990; Siipola and Britton 1994). Finally, in July 1997, the COE completed sediment sampling activities as part of their overall dredging material evaluation program, that included the collection of sediment samples within the Willamette River, including one adjacent to the Gasco site.

Sediment core logs from investigatory activities conducted by Northwest Natural depicting lithologic and contaminant conditions at each core location are provided within Appendix C. Figures depicting sediment sample locations, as well as a summary of available sediment data collected adjacent to the site to date (Northwest Natural, EPA, and U.S. Army Corps data), are included within Appendix J.

3.3.3 Groundwater Quality and Flow Direction Data

Groundwater quality data at the Gasco site has been collected from 7 temporary well points installed in 1995, as well as from 18 permanent monitoring wells that were installed in 1995 and 1998. Well MW-6-61 was decommissioned by removal in 1997. Eight groundwater quality monitoring events have been conducted at the Gasco site to data from the existing monitoring well network. Static groundwater level measurements from the monitoring well network were collected monthly during 1996, and have been collected on a quarterly frequency since that time.

For reference herein, a figure depicting all temporary well point and monitoring well locations, as well as a summary of available groundwater quality data collected at the site to date, including posting maps and time-concentration plots, are included within

Appendix H. Groundwater elevation data, hydrographs, and groundwater flow direction maps and hydrographs may be found within Appendix E. Monitoring well construction logs are provided in Appendix B.

3.3.4 On-Site Surface Water and Sediment Data

On-site surface water and sediment sampling activities were conducted at the Gasco site on January 30, 1996. These activities involved the collection of surface water samples at two locations within the on-site drainage ditch, as well as within each of the three on-site ponds. Additionally, a shallow sediment sample was collected from each of the three on-site ponds. A figure depicting sample locations, and tables summarizing the results of these activities, are included within Appendix I.

3.3.5 Air Quality Data

Sampling for airborne contaminants at the Gasco site has been conducted for chemical exposure monitoring during implementation of the early stages of RI investigatory activities (1995), as well as for ambient air quality monitoring (1996). All monitoring activities were conducted by Paul Carlson Associates, Inc. (PCA), a firm specializing in industrial hygiene issues and air monitoring.

In addition to the above described air monitoring activities, two samples of accumulated dust were collected from the site. A figure depicting air and dust sampling locations, and results of all air monitoring activities, are provided within Appendix K.

3.3.6 Geophysical Data

On November 22, 1995, a preliminary survey with ground penetrating radar (GPR), electromagnetic (EM), and magnetic geophysical methods was conducted in the vicinity of the former Settling Ponds / South Fill Area by GeoPotential of Gresham, Oregon. Three profiles were completed in an attempt to identify and map fill zones, tar zones, and lithologic changes. The results of this survey are included within Appendix L.

3.3.7 Aquifer Testing Data

In order to estimate hydraulic properties of the shallow and intermediate-depth water bearing zones at the Gasco site, rising head slug tests were conducted at a majority of the site wells in March 1996. The raw data summary of results of these testing activities was provided within RI Data Package Report (HAI, 1996). A summary of aquifer slug testing results is included within Appendix E (Table E-2).

4. SITE GEOLOGY

The geologic units of interest at the subject site can be subdivided as follows, from youngest to oldest:

- Surficial Fill Deposits
- Alluvial Deposits
  - Willamette River Deposits
  - Catastrophic Flood Deposits
- Columbia River Basalt Group

4.1 Columbia River Basalt Group

The oldest and lowermost geologic unit of interest at the site consists of the Columbia River Basalt Group. The Miocene-age Columbia River Basalt Group, composed of a series of individual lava flows, generally forms the base (bedrock) of the Portland Basin and outcrops immediately to the southwest of the Site in the Tualatin Mountains.

A bedrock surface elevation map, utilizing RI data as well as data obtained from historical boring logs from 19 geotechnical soil borings that were installed at the site in 1915 during the early stages of development activities, is included as Figure 5. As depicted on Figure 5, from the Tualatin Mountain outcropping, the basalt surface dips steeply to the northeast, with the top of the basalt lying at an elevation near mean sea level [a depth of approximately 36 feet below ground surface (bgs)] in the southern corner of the site (as observed at the MW-12-36 well location), to elevations deeper than -133 feet msl adjacent to the Willamette River (as observed at boring H-4). Based on the predicted slope of the bedrock surface as interpreted with available data, bedrock is likely the deepest beneath the eastern portion of the site, where based on the observed slope in bedrock surface, it is estimated that the bedrock surface could occur at an elevation deeper than -230 feet msl.

4.2 Alluvial Deposits

Overlying the eroded basalt surface at the site are Quaternary-Age alluvial deposits, composed of unconsolidated sands and silts, that range in thickness from approximately 30 feet near St. Helens Road, to an estimated thickness of greater than 200 feet adjacent to the Willamette River. These alluvial deposits have been differentiated by Geraghty & Miller (1991), into the Catastrophic Flood Deposits and Willamette River Deposits. Since these two units may be difficult to differentiate in places, the conceptual site model groups the two units together and refers to them as undifferentiated Alluvial Deposits. The uppermost unit of the undifferentiated Alluvial Deposits in the vicinity of the site has been

identified as a clayey silt by Camp Dresser (1987), while Geraghty & Miller (1991) identified both silt and clay facies associated with the upper zone of the Alluvial Deposits.

Borings installed by HAI at the Gasco site encountered a laterally extensive silt unit, with typically little to no clay content, at the upper portion of the undifferentiated Alluvial Deposits. This silt unit exhibits coloration ranging from olive gray to green, with some areas of orangish-brown mottling. Small sand lenses and rootlet zones are present within portions of the silt unit. Fine to medium-grained sands, silty sands, and relatively thin interbedded silts were encountered below the silt unit at intermediate depths within the undifferentiated Alluvial Deposits.

As depicted in Figure 6, the top of the silt unit was encountered at elevations ranging from 20 to 35 feet msl at the southwestern portion of the site, sloping to the northeast towards the Willamette River where it was encountered at elevations of approximately 5 to 10 feet msl. In general, the top of the silt unit appears to slope more steeply beneath the southwestern portion of the Site at the area of the former Light Oil Plant, Pitch Plant, and Tar Processing Area, with the slope becoming more gradual and even reversing slightly, beneath the central and northeastern portions of the site.

As depicted on Figure 6, the existence of a northwest-southeast trending depression in the top of the silt unit is apparent across the central portion of the site. Two low spots within this depression were identified at locations corresponding to wells MW-6 and MW-11, both locations where dense non-aqueous phase liquids (DNAPLs) have been detected. The depression appears to be oriented roughly parallel to the location of a former creek bed, thought to be a former drainage feature associated with Doane Lake, remnants of which are located to the southeast of the Gasco site (Cameron, 1995). The location of the former creek was identified on a detailed elevation survey map for the Gasco site that was prepared in 1906. The location of the former creek, as surveyed in 1906, is depicted on Figure 6. Of additional note concerning the 1906 survey, it is found that, in general, the pre-fill ground surface elevations at the Gasco site roughly correspond with the elevation of the top of the silt unit at the site, thereby supporting the hypothesis that the silt unit does adequately define the top of the Alluvial Deposits / base of the Surficial Fill Deposits across the site.

With regard to the thickness of the silt unit, based on boring log data and depicted on Figure 7, the thickness of the silt unit is greatest in the central-southeast portion of the site, where thicknesses of up to 35 feet have been identified (boring MW-11). The silt unit appears to thin in all directions from this area of the site, with observed thicknesses of 4.5 (B-14), 6.0 (MW-5), and 2.5 (B-3 and B-8) feet. Although the silt unit appears to be laterally continuous across a majority of the site, because sands and silty sands were encountered across the anticipated depth of the silt unit at borings B-9 (drilled to a depth of -3.4 feet msl), GT-1 (drilled to a depth of –16.9 feet msl) and GT-4 (drilled to a depth of –31.8 feet msl), it appears that a thin silt unit was either missed at these locations as an artifact of the selected soil sampling interval, or that the silt unit may be locally absent at these locations.

4.3 Surficial Fill Deposits

A review of the site history and historical aerial photographs indicates that much of the property, especially to the northeast adjacent to the river, has been extensively filled-in through time. In addition to the overall build-up of ground surface elevations, these filling activities have resulted in the removal of two site drainage features, the creek discussed in Section 4.2, and a drainage ditch formerly located southeast of the southern PNO tank farm, where surface water run-off and manufactured gas plant waste-products were apparently formerly discharged to the Willamette River. Based on review of historical aerial photographs of the site, it appears that this ditch was filled in some time between 1941 and 1961. The axis of this former drainage feature is shown on Figure 3.

Based on results of site investigatory activities, the surficial fill zone was found to overlay the alluvial silt unit with variations in thickness ranging from approximately 2 feet along the southwestern portion of the site near the former Light Oil Plant, to a maximum of 30 feet in the central portion of the site. Much of the fill encountered at the site consisted of poorly graded sands and silty sands that apparently consist of hydraulically placed river-dredge material. However, lampblack, spent oxide materials, quarry reject rock, building debris, and solidified tars were also encountered within the surficial fill unit at the site, especially within the area of the former Tar Ponds and the former Spent Oxide Storage area.

5. SITE HYDROGEOLOGY

Groundwater occurs in three principal hydrologic zones at the site including the unconfined Surficial Fill water-bearing zone (WBZ), the semi-confined Alluvial Sand WBZ, and the confined bedrock aquifers in the Columbia River Basalts. A laterally extensive low permeability silt unit separates the Surficial Fill WBZ from the Alluvial Sand WBZ across a majority of the site.

With respect to the overall regional groundwater flow regime in the vicinity of the Gasco site, it is anticipated that the Tualatin Mountains form a regional groundwater recharge boundary to the southwest of the site, while the Willamette River likely forms a regional groundwater discharge boundary to the northeast, acting as a hydraulic barrier to groundwater flow to the opposite side of the river.

A generalized hydrologic cross-section, depicting the conceptualized groundwater flow regime beneath the site, is provided as Figure 8. General descriptions of each of the three principal hydrologic zones beneath the site are provided below.

5.1 Surficial Fill Water-Bearing Zone

The water table, generally found to be perched within the Surficial Fill WBZ, above the upper alluvial silt unit, has been identified at depths that fluctuate seasonally from 3 to 12 feet bgs (34 to 25 feet msl) at the southwestern portion of the site (well MW-9), and from 9 to 27 feet bgs (25 to 7 feet msl) at the eastern portion of the site (well MW-4-35). Based on the observed seasonal fluctuations of the water table elevation, the overall saturated thickness of this WBZ may be expected to fluctuate from approximately 3 to 25 feet at the northeastern boundary of the site, located adjacent to the Willamette River. Groundwater elevation data for monitoring wells at the site are provided in Appendix E (Table E-1).

As depicted on groundwater elevation maps generated for the site (Appendix E, Figures E1-E18), the groundwater flow direction within the Surficial Fill WBZ is northeasterly towards the Willamette River, with an overall average hydraulic gradient of approximately 0.017. As measured since December 1995, the observed groundwater flow direction within this WBZ has remained relatively constant through time. The calculated hydraulic gradient within this WBZ has been found to fluctuate from a low of 0.010 in February 1996, to a high of 0.020 in September 1996, and February 1997.

As depicted on water level hydrographs for well pairs installed at the site (Appendix E), a downward vertical hydraulic gradient typically exists between the Surficial Fill WBZ and the Alluvial Sand WBZ. An exception to this overall downward hydraulic gradient was noted at the central portion of the site (MW-8 and MW-10 clusters) during the February 1996 Willamette River flooding event, when an upward gradient existed between these units at these locations. A vertical gradient reversal was also noted at the MW-10 location in February and June 1997, as well as in June 1998. These gradient reversals appear to result from rapid increases in river stage, with the Alluvial Sand WBZ directly responding to increases in river stage, while responses in the Surficial Fill WBZ occur more slowly and are less pronounced with increased distance from the river.

Based on slug testing that was conducted by HAI in March 1996, an overall average hydraulic conductivity of 3.9 feet per day (ft/day) was calculated for the fill WBZ, with the lowest calculated hydraulic conductivity identified at well MW-8-29 (0.0067 ft/day), and the highest calculated hydraulic conductivity identified at well MW-4-35 (26 ft/day) (Table E-2).

Based on the referenced hydraulic conductivities, a calculated average hydraulic gradient of 0 020, and an assumed effective porosity of 0.20, the average groundwater flow velocity within the Surficial Fill WBZ is estimated to be 0 4 ft/day, ranging from an estimated 0.0007 ft/day at the MW-8-26 location, to an estimated 2.6 ft/day at the MW-4-35 well location. Such high variability of calculated flow rates is anticipated within the Surficial Fill WBZ, due to the significant heterogeneaties identified within this zone, and the localized area of influence of each slug test.

5.2 Alluvial Sand Water-Bearing Zone

The Alluvial Sand WBZ, encountered below the silt unit at the site, extends to a total depth ranging from approximately 36 feet bgs (0 feet msl) at the southern portion of the site (MW-12-36), to greater than an estimated 265 feet bgs (-230 feet msl) adjacent to the Willamette River. Due to its great apparent thickness, the Alluvial Sand WBZ has been arbitrarily subdivided into intermediate and deep zones. Existing site monitoring wells installed in the Alluvial Sand WBZ are screened within the intermediate zone to depths of 36 to 61 feet bgs (-26 to –20 feet msl), while shallow zone monitoring wells are screened within the Surficial Fill WBZ.

As depicted in groundwater elevation maps generated for the site (Appendix E, Figures E19-E37), the groundwater flow direction within the Alluvial Sand WBZ is northeast towards the Willamette River, with an average hydraulic gradient of 0.016 (as measured between wells MW-10-61 and MW-3-56). As measured since December 1995, the observed groundwater flow direction within this WBZ has remained relatively constant through time. The calculated hydraulic gradient within this WBZ has been found to fluctuate from a low of 0.008 in February 1996, to a high of 0.022 in September 1996.

Based on slug testing that was conducted by HAI in March 1996, an overall average hydraulic conductivity of 0.79 ft/day was calculated for the Alluvial Sand WBZ, with the lowest calculated conductivity identified at well MW-8-56 (0.08 ft/day), and the highest calculated conductivity identified at well MW-6-61 (1.5 ft/day).

Based on the referenced hydraulic conductivities, a calculated average hydraulic gradient of 0.017, and an assumed effective porosity of 0.20, the average groundwater flow velocity within the alluvial WBZ is estimated to be 0.07 ft/day, ranging from an estimated 0.007 ft/day at the MW-8-56 location, to an estimated 0.13 ft/day at the MW-6-61 well location.

5.3 Basalt Unit / Bedrock Aquifer

A boring log for an abandoned bedrock zone industrial water supply well drilled on the southern portion of the Gasco site (exact location unknown) in 1948 indicated competent basalt bedrock to occur from a depth of approximately 61 feet bgs to a depth of 241 feet bgs, below which was an approximate 17 foot thick sand zone (corresponding to the zone of water production) that was underlain by fractured basalt to the total depth of the hole at 370 feet bgs. Notes provided on the boring log for this well indicate that pumping of the well at a rate greater than 140 gallons per minute (gpm) would result in the water level being dropped below the pump.

Boring logs for two 400-foot deep cathodic pipeline protection wells drilled on the southwestern portion of the Gasco site in 1976 and 1985 indicate alternating layers of broken rock with clay layers and competent basalt through the entire drilling interval, with a sandstone, perhaps equivalent to the water producing sand horizon identified within the well log for the supply well, being identified in one of the wells at a depth of 290 to 310 feet bgs. No information on the occurrence of water was provided for either of the cathodic

protection wells. As both wells contain sacrificial anodes and bedding material for the corrosion protection of pipelines at the site, information on water within the bedrock is unavailable at these locations. Boring logs for the former water supply well, and the cathodic protection wells, are included within Appendix D.

Based on the site conceptual model, it is anticipated that groundwater within the basalt unit flows to the northeast towards the Willamette River (a regional discharge zone). An upward hydraulic gradient within the basalt aquifer is likely to occur in the vicinity of the Gasco site and Willamette River, potentially resulting in localized discharge from the basalt aquifer unit upwards into the Alluvial Sand WBZ (Figure 8)

With regard to water use within the bedrock aquifer within the vicinity of the Gasco site, a water well survey conducted for Northwest Natural (Stoel Rives, 1997), identified the presence of twelve documented water wells located on the western side of the Willamette River within a one-mile radius of the Gasco site. Of these twelve wells, eleven were identified as providing an industrial water source, and one was identified as providing a domestic/irrigation water source. None of the eleven industrial wells are currently in service, as the owners have all switched to the use of City of Portland water. The domestic well, located significantly upgradient of the Gasco site within the Tualatin Mountains, is currently used. The well survey did not identify the presence of water wells withdrawing groundwater from either the Surficial Fill WBZ or the Alluvial Sand WBZ.

6. NATURE, EXTENT, AND TRANSPORT OF CONTAMINANANTS

Field observations as identified in soil boring logs (Appendices A and B) indicate that residual tar, oil tar, and lampblack are present within soils at the Gasco site. Oil tar and tar are primarily differentiated herein by their physical characteristics, especially color and viscosity. Specifically, when described herein, tar will refer to a black, viscous to semi-solid petroleum hydrocarbon, while oil tar will refer to a brown to black hydrocarbon that is significantly less viscous than the aforementioned tar and is potentially mobile in the subsurface soils. Additionally, the presence of oil tars in soils as referenced herein, refers to product being visible in a soil sample, and may not include soils that show some other evidence of contamination, such as sheen, odor, or elevated headspace. Lampblack is a term referring to a hydrophobic black powder or sandy material, consisting primarily of carbon, that may contain minor concentrations of petroleum hydrocarbons (Gas Research Institute, 1996).

Free product oil tars, herein referred to as free product DNAPL, or just DNAPL, have been identified in three areas of the site. Free product DNAPL is potentially mobile and recoverable product.

The constituents of primary concern in tars and oil tars are the aromatic hydrocarbons benzene, toluene, ethylbenzene and xylene (BTEX) and polynuclear aromatic hydrocarbon (PAH) compounds. Other contaminants of concern at manufactured gas plant sites include cyanide, phenols, and metals. A discussion on the nature and extent of residual

product, free product DNAPL, as well as identified soil and groundwater impacts is presented in the following sections.

6.1 Residual Product In Soil

Iso-contour maps depicting the distribution of residual oil tar and tar in soils at the Gasco site have been provided in Appendix F. Specifically, Figures F-1 and F-2 depict the depth to the top and the thickness of residual oil tar as observed at the Gasco site, while Figures F-3 and F-4 depict similar information with regard to the tar. These figures also depict the overall lateral extent of observed residual oil tar and tar within soils, as identified during the soil boring program at the site. Cross-sections provided in Appendix M depict the identified extent of observed oil tar and tar within soil borings installed at the site.

6.1.1 Residual Oil Tar

As depicted on Figures F-1 and F-2, residual oil tar has been identified in soil borings installed throughout the southeasterly and central portion of the site, primarily corresponding to the locations of the former Light Oil Plant, northeastward through the former Tar Ponds, and northwestward through the area of the former Retort Area. Additionally, two apparently small and isolated areas of residual oil contamination have also been identified in borings installed in the vicinity of the former Spent Oxide Storage area (MW-1 and B-1) and the PNO tank farm (GT-1).

With regard to the distribution of residual oil tar within soils across the site, it is apparent that several primary source areas for this product may be identified, including: 1) the former Light Oil Plant; 2) the former Retort Area; and 3) the former Tar Settling Ponds. Residual product found in the former Spent Oxide Storage area (MW-1 and B-1) was likely placed there as contaminated fill, while the minor diesel product found in the PNO tank farm area (GT-1) appears related to PNO tank operations.

6.1.1.1 Former Light Oil Plant / Retort Area

The depth to the surface of residual oil tar product (Figure F-1) at the Gasco site was found to be the shallowest (i.e., less than 5 feet bgs) in the immediate vicinity of the former Light Oil Plant (borings B-19 and B-22). In the vicinity of the former Retort Area, residual oil tar was found at a depth of 7.5 feet bgs at boring B-13. The depth to the top of the residual oil tar was typically found to increase with increasing distance from the former Light Oil Plant and Retort Area, with the residual oil tar surface generally corresponding with the top of the underlying silt unit. Based on the preceding, it appears likely that the former Light Oil Plant and the former Retort Area (including the adjacent railroad siding) are the two primary source areas for the oil tar observed throughout the current Northwest Natural LNG Plant and the Koppers Lease areas, with the oil tar subsequently having migrated from these source areas via gravity along the surface of the northeast sloping silt unit, with

a preferential pathway being created due to the permeability contrast between the surficial fill and the underlying silt unit.

With regard to the lateral extent of the oil tar originating from the former Retort Area/Light Oil Plant source areas, it is noted that the northwest-southeast trending depression in the surface of the silt unit (Figure 6), appears to have acted as a barrier to the lateral migration of the mobile oil tar product, generically referred to as DNAPL, to the northeast towards the Willamette River. Lows within this silt unit depression also appear to have acted as preferential areas of DNAPL accumulation. Further discussion of DNAPL is presented in Section 6.2. In addition, the silt unit within the western portion of the Gasco site appears to have acted as a vertical barrier to oil tar product migration, with no oil tar observed below the silt unit in this area.

Evidence to support the above-identified barrier / DNAPL accumulation hypothesis for the depression in the surface of the silt unit is provided by the observed presence of DNAPL within wells MW-6-36 and MW-11-32, located at the overall low points within the depression, and in well MW-10-25, located on the up-dip, source area, side of the depression, while no residual oil tar product or DNAPL has been identified at the B-7, B-10, or MW-13 boring locations, all of which were installed on the opposite side of the depression from the former Retort Area. Although residual oil tar is found on the opposite side of the depression in the southern portion of the site, this is thought to be due to a different source area (see Section 6 1.2).

With regard to the vertical extent of the oil tar product that has apparently been sourced within the Light Oil Plant / former Retort Area, it is noted that a lack of BTEX and PAH detections in groundwater at monitoring well MW-13-61, screened beneath the silt unit downgradient from the apparent product-bearing depression, and a lack of BTEX or significant PAH detections at the MW-10-61 location, installed through the shallow DNAPL and screened below the silt unit at a location down-dip of the suspected source areas, indicates that the silt unit at this portion of the site appears to have acted as an effective barrier to the vertical migration of the DNAPL into the underlying Alluvial Sand WBZ.

In order to verify the lack of DNAPL migration into the Alluvial Sand WBZ at the former Light Oil Plant/Retort source area, a deep Alluvial Sand WBZ well, to be constructed on top of bedrock, has been proposed (HAI, 1998a) for installation in the vicinity of the depression in the silt unit surface, down-dip of the former Light Oil Plant (i.e., near boring B-26).

6.1.1 2 Former Tar Pond Area / B-29 Area

The greatest depth at which residual oil tar in soils has been identified at the Gasco site is in the area of the former Tar Ponds. Specifically, the depth to residual oil tar product at this portion of the site has been found to range from 20 feet bgs (14 feet msl at B-35) to 60 feet bgs (-25 feet msl at B-33). Based on observations made during the installation of borings within the former Tar Pond area, it appears that the observed oil tars have likely been sourced as emulsions or degradation of the thick accumulations of tar that had been disposed of at this

portion of the site. Evidence for such a source is provided by boring logs that indicate the presence of viscous or hardened tar being underlain by vertical fingers of less viscous oil tar that were found to have migrated downward through rootlet casts within the underlying silt unit, and in some cases (B-29, B-32, B-33, B-34, and possibly MW-8), having extended into the upper portion of the underlying Alluvial Sand WBZ.

With regard to the vertical extent of the oil tar identified in the vicinity of the former Tar Ponds, it is noted that the depth to the bottom of the oil tar has been defined at virtually all borings installed at the Gasco site. In the Tar Pond area, the deepest that oil tar was found to extend was to a depth of 67 feet bgs (-32 feet msl) at the B-33 boring location.

Although it appears that the vertical extent of oil tar has been identified beneath the Tar Ponds, in order to more completely evaluate the potential that product may have migrated to greater depths in other areas of the former Tar Ponds, and to define the vertical extent of groundwater contamination at the site, the installation of two deep Alluvial Sand WBZ wells at locations down-gradient of the former Tar Ponds has been proposed (HAI, 1998a). Observations of soil and water quality at these locations will assist in determining the magnitude of deep oil tar impacts at, and down-gradient of, the former Tar Pond area.

Laterally, it is noted that oil tar was not found in soil borings located between the former Tar Ponds and the Willamette River (borings B-31, MW-4, and MW-5), however, oil tar was found to occur (below a thick zone of tar) from a depth of 27 to 39 feet bgs (4 to -8 feet msl) at the B-29 boring location, situated adjacent to the river in the area of the former discharge drainage feature. Although tar was identified in other borings (B-9 and MW-3) installed within drainage feature, no oil tar was found to be associated with the tars at these locations. It appears that the tars and oil tars present at B-9, B-29, and MW-3 are the result of placement during the filling of the drainage feature.

With regard to the lateral extent of oil tar to the south of the former Tar Ponds, based on the location of the former Tar Ponds adjacent to the southern property line, and based on knowledge that soils from the Gasco site were used as fill on the property to the south (i.e., Wacker Siltronic, Inc.), the potential exists that tar and associated oil tar impacts could extend to the Wacker Siltronic, Inc. property.

6.1.1.3 Spent Oxide Storage Area and Vicinity

Soil saturated with oil tar was identified in the vicinity of the former Spent Oxide Storage area at the MW-1 and B-1 boring locations in the northwest portion of the site. The zone of product saturation was found to consist of an interval approximately 5 feet thick located immediately above the silt unit at depths ranging from 16 to 22 feet bgs. Boring logs indicate that much debris had been deposited at this portion of the site as fill, including concrete, bricks, lampblack, and spent oxide. As borings B-2, B-3, B-4, B-5, and B-7, all of which did not show indications of soil impacts, are located between the area of observed oil tar and the primary oil tar source area (former Light Oil Plant / Retort Area at the site), it appears that the identified oil tar was likely directly deposited at this portion of the site as a component of the fill, and its presence is not a result of migration from other portions of the

site. With regard to the character of the observed product, it is noted that well MW-1 is screened directly across the zone of observed oil tar saturation, and that free product DNAPL has not been found within this well. Based on the preceding, it appears that the observed oil tar at the MW-1 / B-1 portion of the site is likely in the form of residual product as opposed to a potentially mobile DNAPL.

As indicated on the lithological log for boring GT-1, a boring installed within the north end of the southern PNO tank farm, petroleum contamination was found to occur from a depth of 8.5 to 11 feet bgs. This product had a diesel odor uncharacteristic of the oil tar encountered at the site, and was found at a depth that indicated it to be likely floating on the water table. Analysis of a soil sample from the zone of product saturation indicated total petroleum hydrocarbons within the diesel range of 13,400 ppm, with no carcinogenic PAHs identified. The preceding, as well as the location of the product being within the PNO tank farm, an area where petroleum products are actively managed, indicates the source of the diesel is likely related to tank farm operations, and is not due to historic manufactured gas plant activities. Finally, the extent of the apparent diesel product in the subsurface appears to be limited, as no such product was identified at adjacent boring locations B-8 or GT-2.

6.1.2 Tar

In addition to tar distillates (oil tar), an extremely viscous / semi-solid, black tar was identified during the investigation in a number of soil borings at the site. Specifically, as depicted on Figures F-3 and F-4, the tar has been identified in soil borings installed throughout the eastern portion of the site corresponding to the location of the Former Tar Ponds and the former drainage feature. Additionally, isolated areas of tar were identified at the location of the former Naphthalene Plant (MW-10), and in the PNO Lease Area at B-6.

Based on tar thicknesses and depths at the site, it appears that the main source area for the observed tars is the former Tar Settling Ponds, where, according to Camp Dresser & McKee (1987), approximately 4,600,000 gallons, or 23,000 cubic yards (dry content) of tar were discharged. At the former Tar Pond area, tar and tar mixed with lampblack were placed (filled) to depths of approximately 25 feet bgs. Directly beneath the tar ponds, tar has migrated vertically into the underlying silt unit, likely due to the mass and weight of the overlying tar. At one location (B-33), tar was found to extend into the Alluvial Sand WBZ, where the maximum depth of tar observed at the site (60 feet bgs) was encountered. Tarry soils typically were encountered within 5 feet of the ground surface in the eastern portion of the site (Figure F-3).

As evidenced by the tars identified at the MW-3, and B-9 and B-29 locations, it appears that tar may have been discharged to the former drainage ditch, and/or used to fill the ditch feature. As observed on historical aerial photographs, this ditch was located to the southeast of PNO's southern-most tank farm, where it discharged into the Willamette River. Elevated PAH concentrations in river sediments collected in the vicinity of the likely confluence of the former drainage ditch with the river, as discussed in Section 6.6 of this report, tends to support the potential that tarry wastes may have historically been

discharged to the river through this former ditch. As no tar was identified within borings GT-3 and GT-4, installed immediately to the northwest of the former ditch and within 50 feet of well MW-3, it appears that the tars are not migrating significantly from their apparent location of deposition within the former ditch feature.

Camp Dresser & McKee (1987) indicated that the drainage feature discussed above likely received the main waste discharges at the site up until 1941, at which time the tar ponds were brought on-line to act as a pollution abatement measure. With regard to the type of wastes discharged, Camp Dresser & McKee indicate that wastes discharged prior to 1925 would be characterized primarily as being wastewaters containing dissolved and suspended hydrocarbons, tar, and spent oxide. After 1925, the amount of tar within the waste stream would have been reduced such that it accounted for only a small amount of tar produced at the site, as tar refining operations were begun that year. Finally, with the start-up of the tar ponds beginning in 1941, the volumes of wastes discharged to the river would have been dramatically reduced at that time.

In summary, boring log data suggests that tars are present within the Fill Unit extending from the location of the former Tar Ponds at the eastern portion of the site, northwestward to the location of the former drainage ditch Based on the thickness of residual tar in soils identified at the Former Tar Pond and drainage ditch areas, it is estimated that in excess of 250,000 cubic yards of tar and tar mixed with soils may be present in the subsurface at this portion of the site.

Approximately 9 5 feet of tarry soils were identified at the MW-10 location, situated at the area of the former Naphthalene Plant. With greater depth the tar at this location is found to become less viscous and more oil-like (oil tar). Although the oil tar extends throughout much of the former Light Oil Plant northward to the former Retort area (as discussed in Section 6.1.1), the tarry soils appear to be restricted to the general area of the former Naphthalene Plant at this portion of the site.

With regard to the tar identified in boring B-6 located near the former Oxide Building and Oxide Storage Area, because the tar was found mixed with sand and brick fragments and was of very limited vertical extent (up to 2.5 feet), it appears likely that the tar was present in fill placed at this portion of the site, and does not represent a source area of significance.

6.2 Free Product DNAPL

Free product DNAPL has been identified at three locations at the Gasco site, all located within the Surficial Fill WBZ and perched on top of the silt unit. Specifically, up to approximately 8 feet of DNAPL has been identified within the bottom of well MW-6-32, while up to 3.5 feet of DNAPL has been identified at the MW-10-26 location, and up to 2 feet of DNAPL has been identified at the MW-11-32 location. It is noted that the observed DNAPL thickness within the wells is apparent, and due to well hydraulics (i e., a lower hydrostatic head within the well than in the surrounding formation) and screen placement (i.e., penetration below the surface of the impermeable barrier), DNAPL thickness within the wells may actually overestimate the DNAPL thickness that is present within the

formation (Huling and Weaver, 1991). With specific respect to the Gasco site for instance, although up to eight feet of DNAPL has been identified within well MW-6, only 2.5 feet of product saturated soils were identified during well installation, suggesting the preceding conditions may be applicable.

The source for the DNAPL at the MW-6 location is likely the former Retort area, while the source for the DNAPL at the MW-10 and MW-11 locations is likely the former Tar Processing area and/or the former Light Oil Plant area. The location of these wells relative to the predicted source areas, as well as variations in the color and odor of the DNAPL between the MW-6 and MW-10/MW-11 locations supports this hypothesis.

With regard to DNAPL transport, it is likely that the DNAPL migrated downward within the Surficial Fill WBZ at the source areas until encountering the silt unit, at which point the permeability contrast between the fill and the silt unit would have caused the DNAPL to migrate laterally via gravity along the top of the silt unit in a down-dip direction. Lows within the silt unit located along the area of the former creek bed (i.e., the silt unit depression) appear to have acted as preferential areas of DNAPL accumulation, and also appear to have prevented the continued migration of DNAPL towards the eastern portion of the site (as detailed in Section 6.1.1.1).

As no DNAPL has been identified in wells installed to the northeast of the silt unit depression, the presence of free product DNAPL (versus residual product contamination) at this portion of the site has not been verified. As discussed in Section 6.1.1.1, in order to more completely ascertain the potential for the occurrence of free product DNAPL at depth below the former Tar Ponds, the installation of two deep Alluvial Sand WBZ wells at locations down-gradient of the former Tar Ponds has been proposed (HAI, 1998a).

Additionally, with regard to the areas of known DNAPL occurrence (within and to the west of the silt unit depression), a pilot test has been proposed by Northwest Natural (HAI, 1998b) involving the extraction of the DNAPL from the wells in which it has been identified. The objective of the testing is to evaluate the pumpability and recoverability of the free product in order to ascertain the viability of such an action as a potential remedy at the site.

6.3 Soil Quality Impacts

Laboratory analyses of soils at the site (Appendix G), including those that contain the residual petroleum products identified above, indicate that soils at the site have primarily been impacted by PAHs, BTEX constituents, and cyanide. Additionally, as discussed below, an area of slightly elevated arsenic concentrations appears to exist at one portion of the site.

6.3.1 Polynuclear Aromatic Hydrocarbons and BTEX Compounds

In total, 136 soil samples from 48 locations have been analyzed for PAHs, while 58 soil samples at 31 locations have been analyzed for BTEX constituents at the site. Detectable

concentrations of total PAHs in soil at Gasco were found to range from less than 0.5 ppm to a maximum concentration 58,822 ppm (B-29 location), while detectable total carcinogenic PAHs in soil were found to range from 0.03 ppm to a maximum concentration of 5,214 ppm (B-29 location). Total BTEX concentrations were found to range from 1.0 ppm to a maximum concentration of 891 ppm (B-18 location), with detectable benzene concentrations ranging from 0.72 ppm to a maximum of 360 ppm (B-18 location) Maximum PAH concentrations tend to be associated with product saturated soils (oil tar and tar) identified in the former Tar Pond portion of the site, while the most significant BTEX contamination tends to be present in both product saturated soils (oil tar and tar) and in soils that bear a petroleum hydrocarbon sheen.

As depicted on the data tables and posting maps provided within Appendix G, the vertical extent of BTEX and PAH contamination within soil at the site has been well defined at most soil boring locations. The most significant impacts are generally restricted to the Surficial Fill Unit, with the exception of the former Tar Pond and drainage ditch areas, where residual tar and oil tar have been found to extend into the silt unit, and in some cases, into the upper Alluvial Sand Unit. At virtually all locations, including the Alluvial Sand Unit, it was found that PAH concentrations declined dramatically just a short distance below zones of observable residual product.

6.3 2 Phenols

In total, 25 soil samples from 20 locations have been analyzed for phenols at the site. Only one soil sample analyzed for phenols resulted in the identification of a phenolic compound. Specifically, pentachlorophenol was identified at the boring B-18 location at a concentration of 0.36 parts per million (ppm), a concentration only slightly above detection limits. The overall lack of phenolic impacts to soil is not unexpected as significant concentrations of phenolic compounds are typically restricted to manufactured gas plant sites that used a coal gasification process, not an oil gasification facility such as Gasco (Gas Research Institute, 1996).

6.3.3 Cyanide

Research conducted at manufactured gas plant sites indicates that cyanides typically exist in complexed forms, with iron complexes dominating (Gas Research Institute, 1996). These cyanide complexes would have been generated during the process of removing sulfur from the product gas, as cyanide within the gas, if any, would also be removed during this process. As oxides were used to remove the sulfur from the gas, the cyanide complexes would be associated with the spent oxide wastes. The iron complexed cyanide (ferrocyanide) within the spent oxide at manufactured gas plant sites may be recognizable by blue staining.

It is of note that the Gas Research Institute (1996) indicates that the most significant quantities of cyanide would be present at coal gasification plant sites, with the least (trace) amounts of cyanide being present at oil gasification sites (e.g., Gasco).

The toxicity of cyanide complexes pertains to the dissociation of free cyanide from the complexed cyanide. The availability of free cyanide is measured by a determination of cyanide that is amenable to chlorination (i.e. amenable cyanide). At the Gasco site, total cyanide data are available for soils, while both total and amenable cyanide data are available for groundwater.

In total, 46 soil samples from 25 locations have been analyzed for cyanide at the site. Detectable concentrations of total cyanide in soil at the Gasco site have been found to range from 0.17 ppm at the B-23 boring location to a maximum of 518 ppm at the MW-9 boring location (a sample of fill material with blue staining). A map depicting available cyanide data for soil at the site is provided in Appendix G (Figure G-4).

The presence of cyanide within soils at numerous locations throughout the site is not unexpected since spent oxide materials were included as fill materials for the site. As the EPA Region 9 Preliminary Remediation Goal (PRG) for free cyanide in industrial soils is 13,628 ppm, and because the free cyanide concentration cannot exceed the total cyanide concentration, it does not appear that the identified cyanide concentrations in soil at the Gasco site pose a significant risk with regard to an Industrial Land Use scenario. The soil to groundwater pathway for cyanide may require additional evaluation should concentrations in groundwater be deemed to pose an unacceptable risk.

6.3.4 Metals

Metals analyses at the Gasco site have primarily been conducted in the area of the former Spent Oxide Storage Area (borings B-1, B-2, and B-3) as the presence of trace metals within the spent oxide materials is deemed likely (Gas Research Institute, 1996). As such, the metals antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc were all analyzed in soil samples collected from the former Spent Oxide Storage area, with five samples being analyzed at this portion of the site. As a follow-up to the preceding, arsenic was analyzed for in soils collected from borings GT-1, GT-2, GT-3, GT-4, and MW-13, with a total of 19 samples being analyzed at these five locations.

With regard to above-identified metals analyses, with the exception of arsenic, sampling at the Gasco site has not identified the presence of metals at concentrations in excess of EPA Region 9 PRGs for industrial soils or DEQ Industrial Maximum Allowable Soil Concentrations. With regard to arsenic, soil samples collected in the area of the former Spent Oxide Storage area (borings B-1, B-2, and B-3) indicated elevated concentrations relative to samples collected from other portions of the PNO Lease Area, with concentrations ranging from 4.9 ppm to 21 ppm being identified. Arsenic concentrations from soil borings installed elsewhere at the site (GT-1 through GT-4, and MW-13) were all found to be less than 3 ppm, which is consistent with typical naturally-occurring background concentrations in the area. Some of the samples collected within these borings did exceed the 2.38 ppm EPA Region 9 PRG for arsenic.

6.3.5 Soil Quality Data Analysis

A detailed presentation and analysis of soil contamination data, prepared by Decision Management Associates LLC, entitled "Preliminary Analysis of Soil Contamination Data, Northwest Natural - Gasco Facility", provided in Appendix 1, includes:

- Evaluation of sampling strategy, duplicate results, and mixes of PAH compounds.
- 3-d scatter plots, histograms, and other plots to help visualize the spatial distribution of contaminants.
- Statistical evidence for and against breaking the site into areas based on surface location and on depth. Several area breakdowns are considered, and depths considered are "surface" (0-0.2 feet), "shallow" (0.2-15 feet), and "deep" (>15 feet).
- Analysis of how concentrations are related to soil odor, sheen, and the presence of residual product (oil tar and tar).
- Analysis of bias in sub surface sampling.
- Evaluation of data gaps and examples of how concentration probability distributions can be constructed from site data for risk analyses.

Conclusions of the above described data analysis are as follows:

- There is substantial small-scale variability superimposed on site-scale trends. The variability is consistent with placement of fill, mixing of soils, and preferential transport of contaminants.
- There appear to be significant differences in concentrations and variability by area and depth. For PAHs, site scale trends include increasing contamination towards the eastern corner of the site, and lower and less variable concentrations at the surface. For benzene, concentrations differ by area and appear consistent with a shallow source spreading down-gradient and deeper.
- The mix of PAHs differs between surface soil and subsurface soil. For surface soils the PAH mix is fairly uniform across the site, while subsurface PAHs show a diversity in mix.
- PAH concentrations are related to soil description (odor, sheen, presence of product). Benzene concentrations tend to be elevated when there is oil or sheen, but the relationship is weaker.
- Surface samples were placed randomly and may be used directly. Sub-surface samples were collected in part based on soil appearance, and are therefore biased. An analysis of the bias indicates that it: 1) increases representation of high-concentration PAH samples by approximately 25%, and 2) has no measurable impact on benzene values.
- Seventeen (17) new soil data samples are identified that would be helpful to improve the completeness and uniformity of samples at the surface and in shallow soil In particular: 1) 10 approximate locations for the collection of additional surface samples

for PAH analyses have been identified, primarily within the PNO and office areas; and 2) 7 approximate locations for the collection of shallow soil samples for PAH and benzene analyses have been identified.

- Constructing concentration/probability distributions requires agreement in selection of approach and in implementation. Examples are provided for three methods (smoothing of empirical data, fitting and use of family of parametric distributions, and manual piece-wise construction of a distribution.). Other data needs may become apparent with construction of the 8 concentration/probability distributions that are needed for assessing risk.

6.4 Groundwater Impacts

Eight rounds of groundwater monitoring events have been conducted since the initiation of RI activities at the Gasco site. The groundwater monitoring network currently consists of 17 monitoring wells, of which, 12 are screened within the Surficial Fill WBZ (shallow zone), and 5 are screened within the intermediate-depth zone of the Alluvial Sand WBZ. Groundwater quality data collected at the Gasco site to date (Appendix H) indicates that groundwater within the Surficial Fill WBZ and the Alluvial Sand WBZ has primarily been impacted by PAHs, BTEX compounds, and cyanide. Additionally, areas of slightly elevated concentrations of metals have been identified at several monitoring well locations. No halogenated volatile organic compounds (HVOCs) have been identified in groundwater at the site, other than 2.2 ppb of tetrachloroethene detected at well MW-11-32 in March 1996. Only low concentrations of phenols have been detected in the groundwater at the site, generally being restricted to those well locations where groundwater is found to have the highest PAH concentrations. Finally, styrene was identified at a low concentration in groundwater within the Surficial Fill WBZ at the MW-12 location.

Reference levels utilized as a screening tool to evaluate the presence of contaminant concentrations in groundwater that would merit additional evaluation in a risk assessment, include the following:

- EPA Maximum Contaminant Levels (MCLs) established for drinking water
- EPA Region 9 Preliminary Remediation Goals (PRGs) established for tap water
- Ambient Water Quality Criteria (AWQC) established under the Federal Clean Water Act, and adopted by DEQ for the protection of aquatic life in surface water.

Although significant dilution will occur upon discharge to the Willamette River, the AWQC were included herein as a screen for identifying contaminants of concern within groundwater since contaminated groundwater at the site ultimately discharges to the river, where AWQC may be applicable. Once groundwater flux to the river is evaluated,

an appropriate dilution factor will be applied to the identified groundwater concentrations to ascertain which contaminants may actually represent constituents of concern at the site.

Understanding that the current and likely future beneficial uses of the Willamette River are recreational, aquatic habitat, and aesthetic, the specific AWQC utilized as a screen herein were as follows: 1) For protection of aquatic life - freshwater acute criteria and freshwater chronic criteria, and 2) for protection of human health - fish consumption criteria were used. In utilizing the AWQC as a screen for groundwater quality, the specific AWQC guidance value with the lowest concentration was utilized. To reemphasize, due to the dilution that occurs when groundwater discharges to the Willamette River, the use of AWQC for screening groundwater contaminant concentrations is very conservative.

6.4.1 Polynuclear Aromatic Hydrocarbons

Maps depicting contoured total PAH concentrations within the Surficial Fill WBZ, as well as in the Alluvial Sand WBZ, during June 1998 are provided in Appendix H (Figures H-2 and H-3).

As sampled in June 1998, the maximum concentration of total PAHs in groundwater at the site was 32,376 parts per billion (ppb), as identified in Surficial Fill WBZ well MW-11-32. Well MW-11-32 contains several feet of free product DNAPL, is located down-gradient of the former Light Oil Plant, and is immediately up-gradient of the former Tar Ponds. Surficial Fill WBZ wells MW-6-32 (down-gradient of the former Retort Area) and MW-10-25 (down-gradient of the former Light Oil Plant and Tar Processing area at the location of the former Naphthalene Plant), also contain DNAPL, with total PAH concentrations in groundwater of 2,245 ppb and 12,162 ppb, respectively, as identified during the June 1998 sampling event.

In addition to the preceding, total PAH concentrations of 12,407 ppb and 17,720 ppb were identified in Surficial Fill WBZ well MW-8-29 and Alluvial Sand WBZ well MW-8-56, respectively, a well pair that has been constructed within the area of the former Tar Ponds. Down-gradient of the former Tar Ponds, at locations adjacent to the Willamette River, total PAH concentrations were found to range from 44 ppb and 95 ppb in Surficial Fill WBZ wells MW-4-35 and MW-5-32, respectively, to 2,299 ppb in Alluvial Sand WBZ well MW-4-57.

Elsewhere at the Gasco site, total PAH concentrations in groundwater typically range from non-detect (wells MW-9-29 and MW-13-61) to less than 1,200 ppb (MW-13-29).

As indicated on the total PAH concentration map for the Surficial Fill WBZ (Figure H-2), it is apparent that the most significant PAH impacts (i.e., greater than 1,000 ppb) within this unit correlate extremely well with that portion of the site where the presence of residual oil tar or free-product DNAPL are found to occur (see Figures F1 and F2), with total PAH concentrations attenuating rapidly down-gradient of the zone of residual product, likely due to the low solubility and mobility of PAH compounds in water.

To better identify a transport mechanism for PAHs in groundwater at the Gasco site, as indicated in the data tables within Appendix H, analyses were conducted in March 1996 for the dissolved fraction (i.e., less than 0.45 micron) of PAHs at well locations MW-6-32 (a DNAPL-bearing well), and MW5-32 (down-gradient of the former Tar Ponds). The results of these dissolved analyses showed that concentrations of total PAHs in groundwater dropped to non-detect at the MW-6 location (from 2,346 ppb), while total PAH concentrations dropped significantly (from 269 ppb to 45 ppb), and total carcinogenic PAH concentrations dropped to non-detect (from 30 ppb) at the MW-5-32 location. The preceding provides evidence that the primary mechanism for PAH transport in groundwater at the site is likely via advection of contaminants that are adsorbed to colloidal material. It is possible that some PAHs in the groundwater samples are the result of mobilizing colloidal material during purging of the wells for sampling.

As indicated on the total PAH concentration map for the intermediate depth zone of the Alluvial Sand WBZ (Figure H-3), the greatest total PAH concentration (17,720 ppb at MW-8) was found to correspond to the area of the former Tar Ponds, the area of the site where residual oil and/or oil tar were identified at the greatest depths and extending into the upper portions of the Alluvial Sand WBZ. Down-gradient of the former Tar Ponds at the MW-4-57 well location, relatively elevated concentrations of PAHs (2,299 ppb) are found to persist, indicating either a greater mobility of the PAH plume within the Alluvial Sand WBZ than there is within the Surficial Fill WBZ, or that their may be oil and/or tar product present within the Alluvial Sand WBZ in the vicinity of the MW-4-57 well location (as was observed at the adjacent B-29 boring location).

Of additional note with regard to the PAH contamination within the Alluvial Sand WBZ, is that although oil tar was found to exist within the Surficial Fill WBZ at the MW-10 (former Naphthalene Plant/ Tar Processing area) and MW-6 (former Retort Area) well locations, with free product DNAPL being identified immediately above the silt unit at these locations, total PAHs in the Alluvial Sand WBZ beneath the silt unit were found to be either non-detect (MW-13-61) or to occur at very low concentrations (6.2 ppb at MW-10-61), with BTEX constituents at both locations found to be non-detect, indicating that the vertical extent of groundwater contamination within the Alluvial Sand WBZ appears to have been adequately defined in the central portion of the site.

To summarize the preceding discussion, existing data indicates that the PAH contaminant plume within the Surficial Fill WBZ is primarily restricted to the portion of the site where residual tar or oil tar contamination has been identified, and that PAH concentrations attenuate rapidly down-gradient of these areas.

With regard to the Alluvial Sand WBZ, it appears that the PAH groundwater contaminant plume is primarily restricted to the eastern portion of the site, within and down-gradient of the former Tar Ponds. Across the central and southern portion of the site the confining nature of the silt unit is such that it appears to prevent the downward migration of contamination into the underlying Alluvial Sand WBZ.

As the screening criteria for numerous of the PAH constituents in groundwater have been exceeded, it appears that further evaluation of these constituents with regard to flux and potential impact to the Willamette River will be necessary.

6.4.2 BTEX Compounds

Maps depicting contoured total BTEX concentrations within the Surficial Fill WBZ, as well as within the Alluvial Sand WBZ, during June 1998 are provided in Appendix H (Figures H-4 and H-5).

As depicted on Figure H-4, the maximum total BTEX concentration identified at the site during the June 1998 groundwater sampling event was 129,270 ppb in Surficial Fill WBZ well MW-10-25, a well containing several feet of free product DNAPL. A temporary well point (BW-19) installed in 1995 adjacent to the former Light Oil Plant at an up-gradient location relative to well MW-10-25 identified the presence of 151,600 ppb total BTEX in the Surficial Fill WBZ, while a temporary well point (BW-21), installed immediately up-gradient of the former Light Oil Plant identified only 6.4 ppb total BTEX constituents. Based on decreasing concentrations of BTEX down- and cross-gradient of the former Light Oil Plant, dramatically decreasing concentrations immediately up-gradient of the plant, it appears likely that the former Light Oil Plant is the source for the bulk of the BTEX groundwater contaminant plume at Gasco. Additionally, based on soil sampling results of product-saturated soils, it appears that the residual oil tar may be a secondary, and ongoing, source for the BTEX contamination present in groundwater.

Down-gradient of the former Light Oil Plant, concentrations of total BTEX within the Surficial Fill WBZ are found to attenuate, with maximum concentrations of less than 100 ppb total BTEX common at the down-gradient limit of the site, adjacent to the Willamette River. In fact, during the June 1998 sampling event, groundwater samples collected from all Surficial Fill WBZ monitoring wells located adjacent to the river resulted in non-detect for BTEX constituents. As observed with the PAH groundwater contamination, and as discussed below, it appears that the primary migration pathway for BTEX-contaminated groundwater to the Willamette River is via the Alluvial Sand WBZ.

As depicted on Figure H-5, the maximum total BTEX concentration identified within the Alluvial Sand WBZ during June 1998 was 26,610 ppb, as detected at well MW-8-56. As previously stated, well MW-8-56 is installed within the area of the former Tar Ponds, the portion of the site where residual tar and oil tar have been found to extend to the greatest depths, having been identified in soils within and below the silt unit in the upper portion of the Alluvial Sand WBZ.

As indicated by the non-detection of BTEX constituents within the Alluvial Sand WBZ at well locations MW-13-61 and MW-10-61, and the relatively lesser concentrations of total BTEX constituents at the MW-3-56 well location (630 ppb) relative to the MW-4-57 location (10,868 ppb), it appears that the BTEX plume is likely migrating downward into the Alluvial Sand WBZ in the vicinity of the former Tar Ponds. Such a pathway would be similar to that described with regard to the PAH impacts identified in groundwater at this

portion of the site, with the exception that the BTEX constituents would be expected to dissolve into groundwater from the residual product much more readily than the PAHs would, due to higher solubility limits.

The preceding indicates that the BTEX groundwater contaminant plume within the Surficial Fill WBZ is primarily restricted to the portion of the site where residual tar or oil tar contamination has been identified, and that BTEX concentrations attenuate rapidly down-gradient of these areas.

With regard to the Alluvial Sand WBZ, it appears that the BTEX contaminant plume is primarily restricted to the area of, and down-gradient of, the former Tar Ponds at the Gasco site.

As the screening criteria for each of the BTEX constituents in groundwater have been exceeded, it appears that further evaluation of these constituents with regard to flux into, and potential impact to, the Willamette River will be necessary.

6.4.3 Cyanide

In general, concentrations of total cyanide have been identified at all well locations (Surficial Fill WBZ and Alluvial Sand WBZ) at the site with the exception wells MW-10-61 and MW-12-36. Maximum detectable concentrations of total cyanide in groundwater at the Gasco site have been identified within the Surficial Fill WBZ at the former Spent Oxide Storage area (wells MW-1-22 and well point B-1) and in the area of the former Tar Ponds (MW-8-29). Specifically, a site-wide maximum cyanide concentration of 11 ppm has been identified at the former Spent Oxide area (MW-1), while a maximum of 4.9 ppm total cyanide has been identified at the former Tar Pond location (MW-8-29). Cyanide concentrations at most other well locations at the site are all relatively uniform, and are typically found to be less than 1 ppm.

The relatively uniform total cyanide concentrations across the site are not suggestive of any one particular source area, but rather appear to be the likely result of the presence of spent oxide within the fill unit across the site, with the cyanide potentially having been leached and transported vertically into the Alluvial Sand WBZ with the tar and oil tar.

Amenable cyanide data has been collected over the previous two groundwater sampling events (February and June 1998), with a maximum concentration of 0.045 ppm being identified at well MW-1-22, located at the former Spent Oxide Storage area.

As summarized in Section 6.2.3, the toxicity of cyanide is primarily associated with the available, or amenable, cyanide fraction. It is of note that amenable cyanide has not been identified in groundwater at any monitoring well location at concentrations in excess of the 0.730 ppm Region 9 EPA PRG for amenable cyanide in tap water. However, as the Fresh Chronic AWQC for cyanide in surface water is 0.0052 ppm, it appears that further evaluation of this constituent with regard to its flux and potential impact to the Willamette River will be necessary.

6.4.4 Metals

Arsenic, chromium, copper, lead, nickel, and zinc concentrations above the screening criteria have been identified in groundwater at the Gasco site. Arsenic, chromium, copper, lead, nickel and zinc have been found to occur at the site No other of the Priority Pollutant metals have been identified in groundwater at the site at concentrations in excess of the screening criteria. It should be noted that some of the screening criteria are well below analytical method detection limits.

Arsenic has been identified at the Gasco site at concentrations in excess of the AWQC screening level of 0.000017 ppm and EPA PRG of 0.00004 ppm at numerous well locations, both within the Surficial Fill WBZ and within the Alluvial Sand WBZ. Dissolved arsenic data are not available for groundwater at the Gasco site other than one sample with the maximum total arsenic concentration identified in groundwater at the site (0.058 ppm within Surficial Fill WBZ well MW-10-25, as sampled in February 1997), where 0.052 ppm of dissolved arsenic was detected. This information suggests that most of the arsenic is in the dissolved state, at least at the MW-10 location.

With respect to chromium, concentrations of total chromium slightly elevated above the AWQC screening levels (0.011 ppm for hexavalent chromium and 0.210 ppm for trivalent chromium) have been identified at numerous well locations, with the greatest dissolved concentrations (0.23 ppm) being identified within the Surficial Fill WBZ at the well MW-10-25 location, the only location where dissolved concentrations have exceeded the MCL or PRG for this constituent.

Copper has been identified at the Gasco site at concentrations in excess of the AWQC screening level of 0.012 ppm at 6 well locations, both within the Surficial Fill WBZ and within the Alluvial Sand WBZ. Copper has not been identified in groundwater at any location in excess of MCLs or PRGs. Dissolved copper data are not available for groundwater at the Gasco site; however, the maximum total copper concentration identified in groundwater at the site was 0.41 ppm within Surficial Fill WBZ well MW-3-26, as sampled in October 1996.

Total lead has been identified within groundwater at 6 well locations at concentrations in excess of the screening criteria. It is noted that dissolved lead was not identified at concentrations above method detection limits at locations where filtered samples were collected, suggesting that the lead is sorbed onto soils and that transport, if any, would be limited to advection via colloidal particles. The maximum detected concentration of lead at the site was 0.099 ppm at well MW-3-26, as sampled in August 1997.

With respect to nickel, elevated concentrations of this constituent, relative to MCLs and AWQC have been identified at Surficial Fill WBZ wells MW-3-26 and MW-10-25, with maximum detected dissolved concentrations of 0.40 ppm and 0.53 ppm, respectively. Dissolved nickel concentrations in excess of screening values have not been identified at other well locations at the site.

Zinc has been identified at the Gasco site at concentrations in excess of the AWQC screening level of 0.110 ppm at numerous well locations, primarily within the Surficial Fill WBZ. Zinc has not been identified in groundwater at any location in excess of MCLs or PRGs Dissolved zinc data are not available for groundwater at the Gasco site. The maximum total zinc concentration identified in groundwater at the site was 3.0 ppm within Surficial Fill WBZ well MW-10-25, as sampled in August 1997.

In summary, arsenic, chromium, copper, lead, nickel, and zinc concentrations elevated above the screening criteria have been identified in groundwater at the site. An evaluation of the identified metals with regard to flux into, and potential impact to, the Willamette River, will be conducted. Because metals are naturally occurring in the environment, an evaluation with respect to natural background water quality will be conducted, if metals issues remain at the site subsequent to the completion of the flux evaluation.

6.5 On-Site Surface Water and Sediment Impacts

On-site surface water and sediment sampling activities were conducted at the Gasco site on January 30, 1996. These activities involved the collection of surface water samples at two locations within the on-site drainage ditch, as well as within each of the three on-site ponds. Additionally, a shallow sediment sample was collected from each of the three on-site ponds. A figure depicting sample locations and tables summarizing the results of these activities have been included within Appendix I.

Results of the surface water sampling indicate PAH and BTEX compounds were present in the pond water and the water that was flowing within the drainage ditch. As the outfall from the on-site ponds to the drainage ditch has been sealed, the source of the water located within the ditch would have been one or more of the following: 1) stormwater runoff from the site; 2) LNG plant process cooling water; and 3) stormwater/groundwater removed by PNO from their tank farm containment basins. As there are no influents into the on-site ponds, and these ponds have been observed to only contain water during the rainy season, the water within these ponds would have been stormwater runoff.

With regard to the PAHs identified within the surface water samples, it is noted that PAH concentrations within all water samples were relatively uniform, with total concentrations ranging from 4 7 ppb to 23.7 ppb, while total PAH concentrations in sediments at the surface water sampling locations (ponds only) were found to range from 1,935 ppm to 21,665 ppm. Based on the large differential between PAH concentrations found in sediment and those found in surface water, and the relatively low concentrations identified in surface water, it appears that due to their relatively low aqueous solubilities and high partitioning coefficients, the PAHs will tend to remain within the sorbed phase in sediments and will not readily transfer to the dissolved phase in surface water. The identified sediment concentrations for PAHs exceed sediment screening levels provided within COE Draft Dredged Material Evaluation Framework, Lower Columbia River Management Area, April 1998.

Although benzene was not identified in any of the on-site sediment samples collected during the referenced investigatory activities, benzene was identified in surface water samples collected from the on-site ponds at concentrations ranging from 0.92 ppb to 3.1 ppb, while benzene was identified within the drainage ditch at concentrations of 110 ppb near the head of the ditch, and at 6.2 ppb near the outfall of the ditch. The benzene concentration identified near the outfall of the ditch does not exceed AWQC for protection of aquatic life or fish consumption.

6.6 Willamette River and Sediment Impacts

With regard to sediment-related investigatory activities conducted in the vicinity of the Gasco site, the following data are available: 1) data collected by Northwest Natural as part of 1996 RI activities; 2) data collected as part of the 1997 EPA Site Inspection of a six-mile reach of the Willamette River (Weston, 1998), 3) data collected as part of the 1997 COE dredging material evaluation program (COE, 1998), and 4) data collected as part of COE sediment evaluations conducted at the U.S. Moorings Station, located immediately down-river of the Gasco site (Britton, 1990; Stipola and Britton 1994). All data point locations within the vicinity of the Gasco site (River Mile 6.0 to 7.0) are provided on Figures J-1 and J-2. It is noted that due to the close spacing of samples collected at the U.S. Moorings Station, it was not possible to depict these locations on the referenced figure. Instead, Figure J-3 provides a COE map that depicts the U.S. Moorings sediment sampling locations.

Figure J-4 provides a bar chart depicting total PAH concentrations for sediment data (Northwest Natural, EPA, and 1998 COE data), posted in relative sampling order from up-stream to down-stream across the Gasco site. Again, due to the large number of sampling points over a relatively small area, the COE U.S. Moorings data was not included on the referenced chart. A summary of sediment data collected by Northwest Natural is provided in Table J-1. A summary of all available sediment PAH data for river miles 6.0 to 7.0 (Northwest Natural, EPA, and all COE data) is provided in Table J-2. Sediment core logs depicting lithologic and contaminant conditions at borings installed as part of Northwest Natural's RI program are provided within Appendix C.

Sediment boring logs indicate that solid to semi-solid tar is present within the river sediments at locations adjacent to the former Tar Pond and former drainage ditch discharge areas, with field evidence (i.e., sheen and/or odor) of petroleum hydrocarbon impacts at other sampling locations adjacent to the site. Tar was found to be present within sediments both at the riverbed surface (SD-7) and extending to depths of at least 8 feet below the riverbed surface (SD-8). It is suspected that this tar is depositional in nature, that is, it was deposited as discharges from the Gasco site during manufactured gas plant operations, as opposed to migrating to the sediments via the subsurface soils.

In general, total PAH concentrations in surface sediments between river mile 6.0 and 7.0 were found to be the greatest at locations adjacent to the central portion of the Gasco site near the discharge point of the former drainage ditch, with impacts found to extend towards the center of the river at least as far as the main shipping channel (approximately 750 feet

from the shoreline), as observed at the WR-BC-22 sampling location. Specifically, total PAH concentrations in surface sediments adjacent to the Gasco site were found to range from 85 ppm at the SD-063 location, to 26,408 ppm at the SD-7 location (corresponding to a zone of tarry gravel), with a concentration of 1,418 ppm being identified at the WR-BC-22 location in the main shipping channel. Total PAH concentrations in sediments collected from depths of less than 6 5 feet at the U.S. Moorings Station, located immediately down-river of the Gasco site, were found to range from 89 to 142 ppm in 1989 (Britton, 1990), while total PAH concentrations in surface sediments were found to range from 8 to 59 ppm in 1994 (Siipola and Britton, 1994).

As depicted on Figure J-4, total PAH concentrations in sediment samples collected at upstream and downstream locations show a marked decline relative to those collected adjacent to the Gasco site. Also, sediment samples collected on the opposite side of the river from the Gasco site did not result in the identification of significant PAH impacts.

Vertically, as identified at the SD-8 boring location, elevated PAH concentrations were found to extend at least to 9 feet below the river bed surface, with tar being found at that location to a depth of 8 feet bgs.

With regard to the presence of tar within the river sediments adjacent to the Gasco site, it is known that discharges of waste waters to the river from manufactured gas plant operations and the Tar Ponds occurred via the former drainage feature during the operation of the manufactured gas plant at the site, and that such discharges may account for the presence of these tars. The tar identified in soil borings installed adjacent to the river (B-29, B-31) would not be expected to migrate to the river sediments due to the overall high viscosity/low mobility of this material.

As identified during monthly shoreline inspections conducted at the Gasco facility, an area of hardened tar balls, some with a viscous center, exists along the Gasco shoreline at a location downstream from the former drainage ditch. The zone of tar ball accumulation has been found to dissipate before the downstream property line is reached. The presence of these tar balls is indicative that tar is present within the river sediments, but that the tar, in hardened form, has not been significantly transported down-stream by river current.

With regard to oil tar, it is noted that a description matching that of oil tar was provided for shallow river sediments (upper 17 inches) at a location adjacent to the former Tar Ponds in sediment sample SD-067, collected as part of the EPA Portland Harbor Sediment Study Investigation (EPA, 1998). It is unclear whether the oil tar at this location is present as a result of former surface discharges to the river, is a result of separation from the tar known to be present within the river, or is actively being sourced from the upland portion of the Gasco site.

With regard to the ongoing upland source potential, sufficient data to resolve this issue with respect to the former Tar Pond area should exist once the proposed deep Alluvial Sand WBZ wells to be installed between the former Tar Ponds and the river are constructed (HAI, 1998a). Also, additional evaluation with regard to the oil tars identified at the B-29 boring location, within the former low-lying area adjacent to the former drainage ditch, appears necessary in order to completely evaluate the potential for an ongoing upland

source of oil tar into the river. Finally, it is noted that additional evaluation with regard to the extent, transport, and toxicity of impacted sediments adjacent to the Gasco site is necessary.

With regard to site impacts to surface water in the Willamette River, although surface water samples have not been collected from the river, it will be possible to ascertain potential impacts to the river from the site by evaluating the predicted flux of contaminated groundwater to the adjacent river, as well as by direct analysis of the river water and sediment porewater. An evaluation of flux to the river will be conducted subsequent to the installation of the proposed deep Alluvial Sand WBZ wells at this portion of the site (HAI, 1998a), which will provide necessary information regarding the vertical extent of groundwater impacts.

6.7 Air Impacts

Sampling for airborne contaminants at the Gasco site has been conducted for chemical exposure monitoring during implementation of the early stages of RI investigatory activities, as well as for ambient air quality monitoring. The objective of the chemical exposure monitoring was to ensure an adequate level of respiratory protection during the investigatory activities. The objective of the ambient air monitoring was to provide a general assessment of ambient air quality at a location downwind from the LNG containment basin, the Koppers lease area, and the former Tar Pond area All monitoring activities were conducted by Paul Carlson Associates, Inc. (PCA), a firm specializing in industrial hygiene issues and air monitoring.

With regard to the chemical exposure monitoring, representative breathing zone concentrations of PAHs, BTEX, metals, cyanide, and total particulate were measured during soil boring installation activities carried out at the Former Light Oil Plant (borings B-18 and B-19), the Former Koppers Land Treatment Area (B-27), and the Former Spent Oxide Storage Area (B-1, B-2, and B-3). Results of the monitoring indicated the presence of PAHs, BTEX, and the metal titanium in certain of the air samples, with no other metals or cyanide being identified in the air samples. Concentrations of the identified constituents all fell below the Oregon Occupational Safety & Health Administration (OR-OSHA) Permissible Exposure Limits (PELs), designed to ensure the health of employees. The air monitoring data, and the summary report prepared by PCA, is included within Appendix K. Figure K-1 depicts the location of the air monitoring station.

With regard to the ambient air monitoring, this monitoring was conducted with a pump sampler over a period of approximately 6 hours on February 27, 1996 at the downwind (north) side of the LNG containment basin. The air sample was analyzed for the presence of particulates, PAHs, and BTEX constituents. Results of the monitoring event indicated that particulates (i.e., dust), PAHs, and BTEX constituents were all non-detect during the period of the referenced event. The air monitoring data and the summary report prepared by PCA are included within Appendix K.

In addition to the above described air monitoring activities, two samples of accumulated dust were collected from the site (Figure K-1) Specifically, one dust sample was collected from within the fire hose containment box located within the Northwest Natural LNG process area (near well MW-9), and one dust sample was collected from within the fire hose box located directly adjacent to the vehicle exit doorway to the Koppers pencil pitch warehouse. The doors on both fire hose boxes had been ajar, allowing dust to accumulate on the shelving within. The timing of the dust accumulation (i.e., deposition caused by certain climatic conditions and / or site operations) is unknown.

Based on the proximity to the pencil pitch warehouse, the presence of pencil pitch on the ground in the vicinity of the fire hose box, and the black nature of the dust sample, it appeared that the dust sample collected adjacent to the Koppers pencil pitch warehouse was very likely pencil pitch dust derived from the Koppers warehouse operations The dust sample collected in the Northwest Natural LNG process area did not have the appearance of pencil pitch Both dust samples were analyzed for PAHs.

Results of the dust sample analyses indicate the presence of 381 ppm total PAHs within the dust sample collected from the LNG process area fire hose box, while 26,919 ppm total PAHs were identified within the sample of pencil pitch dust collected adjacent to the Koppers pencil pitch storage warehouse A comparison of individual PAH fractions to the total PAH concentration was conducted for both of the dust samples. The comparison indicates a very close match exists between the ratio of individual PAHs to the total PAHs between the two samples, suggesting a common source. In this case, the source appears to be the Koppers pencil pitch storage warehouse. Laboratory sheets for the two dust samples, as well as a chart comparing the PAH ratios between the two samples, are provided within Appendix K, with additional discussion of PAH mixes provided within Appendix 1 (Decision Management Associates Report).

6.8 Contaminants of Concern

6.8.1 Soil

As summarized on the data tables provided in Appendix G, based on investigatory activities conducted at the site to date, PAHs, benzene, toluene, ethylbenzene, and arsenic have been detected in soils at the site at concentrations exceeding screening criteria. Specifically, PAHs and BTEX concentrations have been found to exceed DEQ Cleanup Levels as identified in the ODEQ Soil Cleanup Table (OAR 340-122-045) and/or Region IX PRGs, while arsenic concentrations exceed DEQ Industrial Maximum Allowable Soil Concentrations (OAR 340-122-045).

Pentachlorophenol, cyanide, and the metals antimony, cadmium, chromium, copper, lead, nickel, thallium, and zinc have all been identified in soil samples collected at the site, but none of these constituents were identified at concentrations exceeding EPA Region 9 PRGs, DEQ Soil Cleanup Levels, and/or DEQ Industrial Maximum Allowable Soil Concentrations, where established.

With regard to amenable cyanide, because the amenable cyanide concentration cannot exceed the total cyanide concentration, and because the maximum identified total cyanide concentration in soil (518 ppm) is well below the 13,628 ppm EPA Region 9 PRG for amenable cyanide, it does not appear that amenable cyanide is a concern with respect to soil quality at the site. However, the soil leaching to groundwater pathway may need further evaluation for cyanide.

Based on the results of the RI activities conducted at the Gasco site to date, the contaminants of concern with respect to soil impacts at the site appear to be limited to the following:

- PAHs
- Volatile aromatic hydrocarbons (benzene, toluene, ethylbenzene)
- Arsenic
- Cyanide

6.8.2 Groundwater

As summarized on the data tables provided in Appendix H, with respect to groundwater quality, PAHs, BTEX compounds, 2,4-dimethylphenol, total cresols (2-, 3-, and 4-methylphenol), styrene, tetrachloroethene, arsenic, chromium, copper, lead, nickel, zinc, and cyanide, have all been detected at concentrations exceeding one or more of the following screening criteria: EPA MCLs established for drinking water, EPA Region 9 PRGs for tap water, and/or the federal AWQC established under the Clean Water Act for the protection of aquatic life and human health. The AWQC were included herein as a screen for identifying contaminants of concern within groundwater since contaminated groundwater at the site does discharge to the Willamette River, where the AWQC may be applicable.

With regard to 2,4-dimethylphenol and total cresols, it is noted that these constituents have been identified at concentrations in excess of the screening criteria at two well locations (i.e., wells MW-10-25 and MW-11-32), both of which are DNAPL-containing wells. Concentrations of these constituents have not been identified above the screening criteria at down-gradient well MW-4-57, the most highly contaminated well located adjacent to the river. As such, it does not appear that these constituents are mobile within the subsurface. Based on the preceding, and assuming that the use of groundwater at the site for a drinking water source would not be a potential beneficial use, then it does not appear that a receptor would exist for the phenol impacted groundwater, and as such, 2-4-dimethylphenol and total cresols do not appear to pose a concern with regard to groundwater quality at the site. All other phenols were identified at concentrations below the referenced screening criteria.

With regard to styrene, this constituent has been identified at the MW-12-36 well location at a maximum concentration of 170 ppb, with styrene having never been identified at

locations down-gradient from well MW-12 (i.e., wells MW-4-56, MW-5-32, MW-8-56, or MW-11-32). The drinking water MCL for styrene is 100 ppb, while the tap water PRG for this constituent is 1,641 ppb. No AWQC for this constituent has been developed. The lack of styrene detections down-gradient of well MW-12 indicates that this constituent does not appear to be migrating towards the river. Based on the preceding, and assuming that the use of groundwater at the site for a drinking water source would not be a potential beneficial use, then it does not appear that a receptor would exist for the styrene impacted groundwater, and as such, styrene does not appear to pose a concern with regard to groundwater quality at the site.

With regard to tetrachloroethene (PCE), this constituent was identified at the MW-11-32 well location in March 1996 at an estimated concentration of 2.2 ppb, below the 5 ppb MCL and 9 ppb AWQC screening values, but slightly above the 1.08 PRG for this constituent. Due to the low concentration identified, the lack of subsequent detections at the MW-11 location, as well as a lack of detection at the up-gradient and down-gradient well locations, it does not appear that PCE poses a concern with regard to groundwater quality at the Gasco site.

Based on the results of the RI activities conducted at the Gasco site to date, the contaminants of concern with respect to groundwater impacts at the site appear to be limited to the following:

- PAHs
- Volatile aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes)
- Cyanide
- Arsenic
- Chromium
- Copper
- Lead
- Nickel
- Zinc

7. CONCLUSIONS

The purpose of the data presentation and evaluation presented herein has been to provide a summary and analysis of existing data collected as part of Phase I RI activities at the Gasco site to assist in the understanding of the site, and to guide decisions regarding additional data acquisition. The conclusions presented below are based on the analysis of data presented herein.

7.1 Hydrogeological Conditions

- Groundwater occurs in three principal hydrologic zones at the site including the unconfined Surficial Fill WBZ, the semi-confined Alluvial Sand WBZ, and confined bedrock aquifers in the Columbia River Basalts.

- A silt unit, correlating to the depth of pre-fill ground surface elevations, separates the Surficial Fill WBZ from the Alluvial Sand WBZ across a majority of the site. A northwest-southeast trending depression in the surface of the silt unit exists across the center of the site, correlating with the location of a pre-fill creek bed.

- Groundwater within the Surficial Fill WBZ and the Alluvial Sand WBZ appears to be hydraulically connected to the Willamette River, with groundwater flow beneath the site being to the northeast towards, and discharging to, the river.

- A downward vertical hydraulic gradient between the Surficial Fill and the Alluvial Sand WBZ predominates, with reversals being identified at certain locations during times of high river stage.

9 Depth to bedrock across the site is estimated to range from 36 feet bgs at the southwestern portion of the site near NW. St. Helens Road, to more than 250 feet bgs at the southeastern portion of the site adjacent to the Willamette River.

7.2 Nature, Extent, and Transport of Contamination

Soil, sediment, and groundwater contamination has been found to be associated with the presence of residual manufactured gas plant wastes at the property, primarily tar and oil tar (PAHs and BTEX), and spent oxide materials (metals and cyanide).

7.2.1 Residual Tar, Oil Tar, and DNAPL

- Tar has been found to be primarily restricted to the southeastern portion of the site at the former Tar Pond area and the location of a former drainage feature, areas where tar-bearing wastes were discharged and/or mixed with fill.

- Residual oil tar has been identified throughout the southern, southeastern and west-central portions of the site, likely sourced from the former Light Oil Plant, former Retort area, former Tar Ponds, and a former drainage feature.

- The silt unit has likely prevented oil tar impacts derived from the Light Oil Plant/Retort Area from migrating vertically into the underlying Alluvial Sand WBZ, with oil tar having migrated from these areas via gravity along the surface of the northeast sloping silt unit. The northwest - southeast trending depression in the surface of the silt unit has acted as a barrier to the lateral migration of the mobile oil tar product to the northeast and towards the Willamette River.

- Oil tar has been found to extend through the silt unit and into the upper portions of the Alluvial Sand WBZ at several locations within the southeastern portion of the site (former Tar Ponds), correlating to areas with the greatest accumulations of tar.

- Oil tar was found within the Alluvial Sand WBZ within the former drainage feature, the only location where oil tar is found adjacent to the Willamette River.

- Soil boring data indicates that the lateral and vertical extent of tar and oil tar have been generally defined across the site. Laterally, tar and oil tar may likely extend across the southeastern property boundary, where placement of these materials as fill may have occurred

- Three areas of free product DNAPL (oil tar) have been identified within the Surficial Fill WBZ at the site. Two areas of DNAPL occurrence are located on top of the silt at areas where the silt surface is depressed. The third is located up-slope of the depression, but down-slope of the identified oil tar source area.

7.2.2 Soil Quality Impacts

10 Based on the evaluation conducted to date, constituents of concern with regard to soils at the site are PAHs, benzene, toluene, ethylbenzene, and arsenic.

- BTEX and PAH concentrations above EPA Region 9 PRGs are found in the zones of tar and oil tar contamination.

- The vertical extent of BTEX and PAH contamination within soil has been well defined at most soil boring locations, with the most significant impacts being restricted to the surficial fill unit, except in the former Tar Pond area, where contaminants have extended into the alluvial sand unit.

- Cyanide was identified in soils throughout the site, likely as the result of spent oxide materials within fill materials. The maximum total cyanide detection in soil was 518 ppm, well below the 13,628 ppm EPA Region 9 PRG for free cyanide in industrial soils. However, cyanide in soil may be an issue at the site with regard to leaching to

groundwater, should it be determined that an unsatisfactory risk with regard to groundwater concentrations exists.

- Elevated concentrations of arsenic, relative to screening levels and to soils from other portions of the site, were identified within the former Spent Oxide Storage Area.

Statistical evaluation of the data, as conducted by Decision Management Associates LLC developed the following conclusions with respect to soil quality at the site:

- Data visualization and analysis show substantial small-scale variability superimposed on site-scale trends, with the variability consistent with fill placement, mixing, and preferential transport of contaminants.

- The primary site-scale trend for PAHs is for greater contamination towards the southeastern corner of the site.

- Significant differences in concentrations and variability exist by area and depth.

- PAH concentrations are related to field evidence of contamination (odor, sheen, presence of product), with a lesser relationship being identified with benzene.

- For Risk Assessment purposes, since surface samples were collected randomly this data may be used directly, while sub-surface samples were collected in part based on soil appearance, and are therefore biased. However, the bias in the sampling was found to: 1) increase representation of high-concentration PAH samples by about 25%, and 2) has no measurable impact on benzene values.

7.2.3 Groundwater Impacts

- Groundwater contamination, primarily PAH, BTEX, and cyanide related, has been identified within both the Surficial Fill WBZ and the Alluvial Sand WBZ.

- The former Light Oil Plant is the likely source for the bulk of the BTEX groundwater contaminant plume at Gasco, with the residual oil tar at the site being a secondary, and ongoing, source for the BTEX contamination present in groundwater.

- Oil tar and tar-saturated soils appear to be the source of the PAH impacts to groundwater at the site.

- With regard to the Surficial Fill WBZ, both the BTEX and PAH groundwater contaminant plumes tend to be primarily restricted to the portion of the site where residual tar or oil tar contamination has been identified, with concentrations attenuating rapidly down-gradient of these areas. However, the vertical extent of BTEX and PAH groundwater contamination down-gradient of the former Tar Ponds has not been defined.

- With regard to the Alluvial Sand WBZ, it has been found that the BTEX and PAH contaminant plume is primarily restricted to the eastern portion of the site, within and down-gradient of the former Tar Ponds

- Areas of metals concentrations elevated above screening criteria have been identified in groundwater at the site. Specifically, arsenic, chromium, copper, lead, nickel and zinc have been found at concentrations above AWQC, a potential concern because of discharge to the Willamette River.

7.2.4 On-Site Surface Water Impacts

- Results of surface water sampling of the on-site pond water and within the water that was flowing within the on-site drainage ditch indicates that only benzene, at the head of the ditch, was found to exceed screening criteria (AWQC). The benzene concentration identified near the outfall of the ditch does not exceed AWQC for protection of aquatic life or fish consumption.

7.2 5 Sediment Impacts

- Sampling activities identified the presence of solid to semi-solid tar within Willamette River sediments at locations adjacent to the former Tar Pond and former drainage ditch discharge areas, with field evidence of petroleum hydrocarbon impacts at other sampling locations adjacent to the site. Tar was found to be present within sediments at the riverbed surface, extending to depths of at least 8 feet below the riverbed surface at one location

- It is suspected that the tar identified in the sediments adjacent to the Gasco site is depositional in nature, having been deposited as discharges from the Gasco site during manufactured gas plant operations.

- An area of hardened tar balls exists along the Gasco shoreline at a location downstream from the former drainage ditch. The zone of tar ball accumulation has been found to dissipate before the downstream property line is reached. The presence of these tar balls is indicative that tar is present within the river sediments, but that the tar, in hardened form, has not been significantly transported down-stream by river current.

- Total PAH concentrations in surface sediments in the vicinity of Gasco were found to be the greatest at locations adjacent to the central portion of the site near the discharge point of the former drainage ditch, with impacts found to extend towards the center of the river at least as far as the main shipping channel (approximately 750 feet from the shoreline).

- Total PAH concentrations in surface sediments adjacent to the Gasco site were found to range from 85 ppm to 26,408 ppm (corresponding to a zone of tarry gravel), with a

concentration of 1,418 ppm being identified within the main shipping channel. Total PAH concentrations in sediment samples collected at upstream and downstream locations show a marked decline relative to those collected adjacent to the Gasco site.

- PAHs were identified within sediment samples collected from the three on-site ponds located at the southeastern portion of the site, with concentrations ranging from 1,935 ppm too 21,665 ppm being identified.

7.2.6 Air Quality

- Breathing zone monitoring conducted during drilling activities at the site indicated the presence of PAHs, BTEX, and the metal titanium in certain of the air samples. Concentrations of the identified constituents all fell below limits designed to ensure the health of employees.

- Ambient air monitoring conducted downwind of the LNG containment basin indicated that PAHs and BTEX constituents were all non-detect during the period of the referenced event.

- Analysis and evaluation two dust samples at the site indicate that Koppers pencil pitch may be a contributing factor with regard to PAHs identified in surface soils at the site.

7.3 Existing Data Needs

Based on the findings of RI activities conducted at the site to date, as evaluated herein, the following data needs have been identified such that the objectives of the RI may be satisfied:

7.3.1 Risk Assessment Data Needs

- Statistical data evaluation indicates a need for the collection of ten additional surface soil samples at the site, primarily within the northwest (former office area), and northeast (PNO lease area) portions of the site.

- Statistical data evaluation indicates a need for the collection of seven shallow (<15 feet) soil samples at the site.

7.3.2 Contaminant Nature, Extent and Transport Data Needs

- The vertical extent of groundwater contamination at the site is not defined. The installation of three deep (up to 160 feet bgs) Alluvial Sand WBZ wells, two down-gradient of the former Tar Ponds, and one down-gradient of the former Light Oil Plant area, have been proposed to satisfy this data need (HAI, 1998a).

- Verification should be obtained that the vertical extent of DNAPL (oil tar) migration has been adequately defined at the site. The installation of the referenced deep Alluvial Sand WBZ wells to be installed down-gradient of the former Tar Ponds, and the deep well to be installed down-gradient of the former Light Oil Plant have been proposed to satisfy this data need (HAI, 1998a).

- Conclusions with regard to the active migration of DNAPL to the Willamette River within the area of the former Tar Ponds and the former drainage feature (B-29 boring) are necessary. The two deep Alluvial Sand WBZ wells to be installed down-gradient of the former Tar Ponds will satisfy this data need with respect to former Tar Pond portion of the site. Additional evaluation appears necessary to satisfy the data need with respect to the B-29/former drainage feature area.

- The lateral extent of on-site groundwater contamination should be defined. The installation of an intermediate-depth (65 feet bgs) monitoring well to be installed within the PNO area at the northeastern portion of the site, and depth-discrete groundwater data to be collected from temporary well points installed at the eastern corner of the site (MW-5 location) will satisfy this data need (HAI, 1998a)

- The on-site lateral extent of residual tar and oil tar in soil should be defined to the northeast of the LNG containment basin.

- An evaluation of the physical and chemical make-up of the free product DNAPL (oil tar) should be conducted to assist in the feasibility study and to assess contaminant transport issues. Additionally, the recoverability of DNAPL from wells at the site should be evaluated. Activities necessary to satisfy these data needs have been proposed (HAI, 1998b).

- Additional evaluation with regard to the extent of contamination in Willamette River sediments is necessary. Such an evaluation may include toxicological studies, porewater and sediment sampling activities, as well as an evaluation of river dynamics with regard to contaminant transport.

- An evaluation of contaminated groundwater flux to the Willamette River should be conducted following the completion of groundwater quality-related data gaps described herein.

8. LIMITATIONS

The samples discussed in this report were collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon physical sampling and analytical activities that were conducted at the Client's request. The data presented in this report document only the concentrations of the target analytes in the particular sample and not the property as a whole.

(HAI 10/95)

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10. GLOSSARY OF ABBREVIATIONS

AWQC	Ambient Water Quality Criteria
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
DEQ	Oregon Department of Environmental Quality
DNAPL	dense non-aqueous phase liquid
EM	electromagnetic
EPA	U.S. Environmental Protection Agency
gpm	gallon per minute
GPR	ground penetrating radar
HAI	Hahn and Associates, Inc.
HVOCs	halogenated volatile organic compounds
LNG	liquefied natural gas
MCL	Maximum Contaminant Level
msl	mean sea level
OAR	Oregon Administrative Rule
OR-OSHA	Oregon Occupational Safety and Health Agency
PAHs	polynuclear aromatic hydrocarbons
PCA	Paul Carlson Associates, Inc.
PEL	permissible exposure level
PNO	Pacific Northern Oil
ppb	parts per billion
ppm	parts per million
PRGs	Preliminary Remediation Goals
ppb	parts per billion
RI	remedial investigation
SI	Site Inspection
WBZ	water-bearing zone

Any questions regarding the information presented in this report are welcome and should be referred to the undersigned Thank you for the opportunity to be of service to Northwest Natural in this manner.

Hahn and Associates, Inc.

Prepared by:

Robert B. Ede, R.G
Sr. Project Manager

Reviewed by:

Roger E. Brown, R.G.
Principal

Date 10/9/98

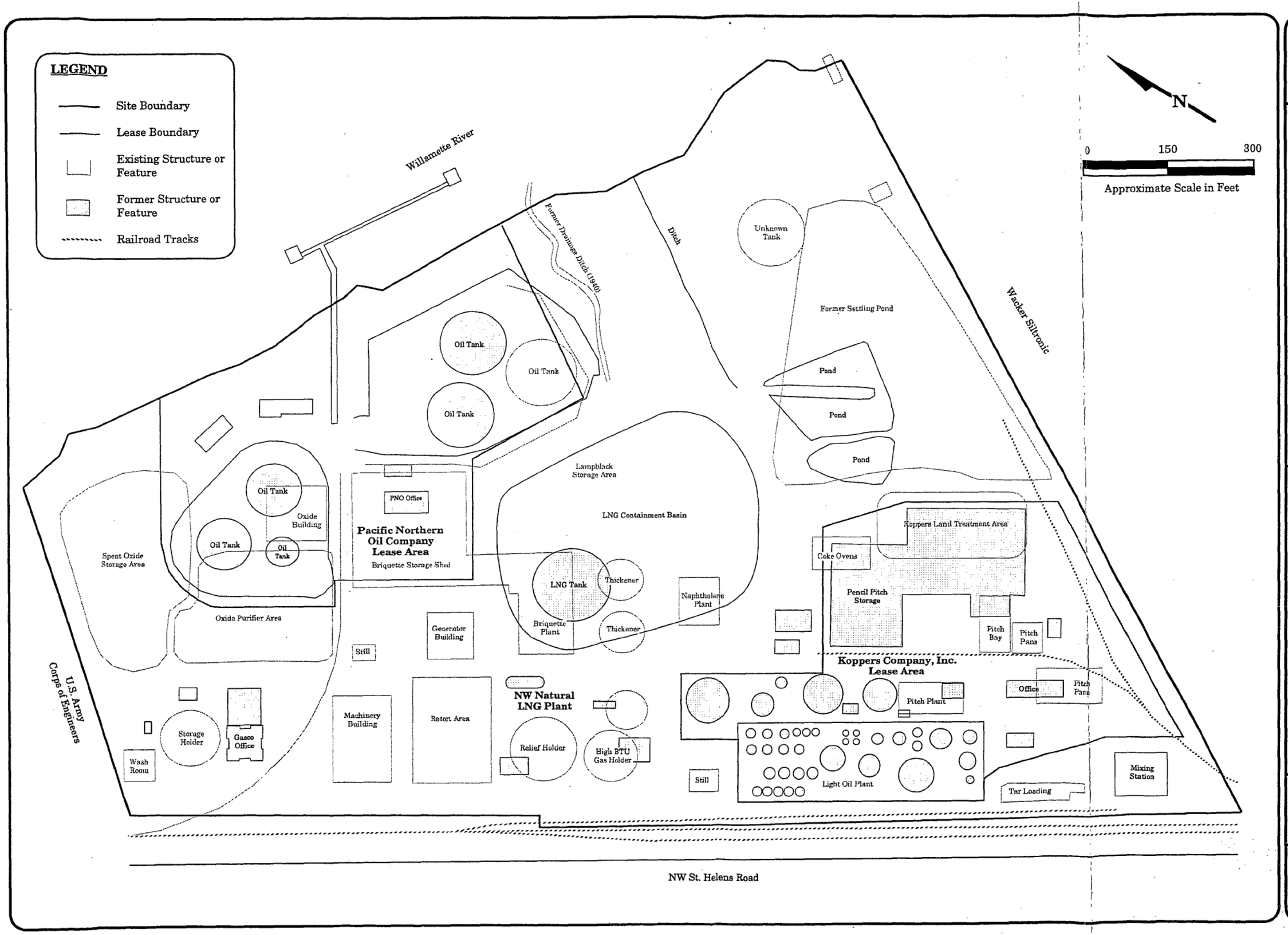

Figure 3

Historical Features Map

Remedial Investigation
Northwest Natural – Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project No. 2708

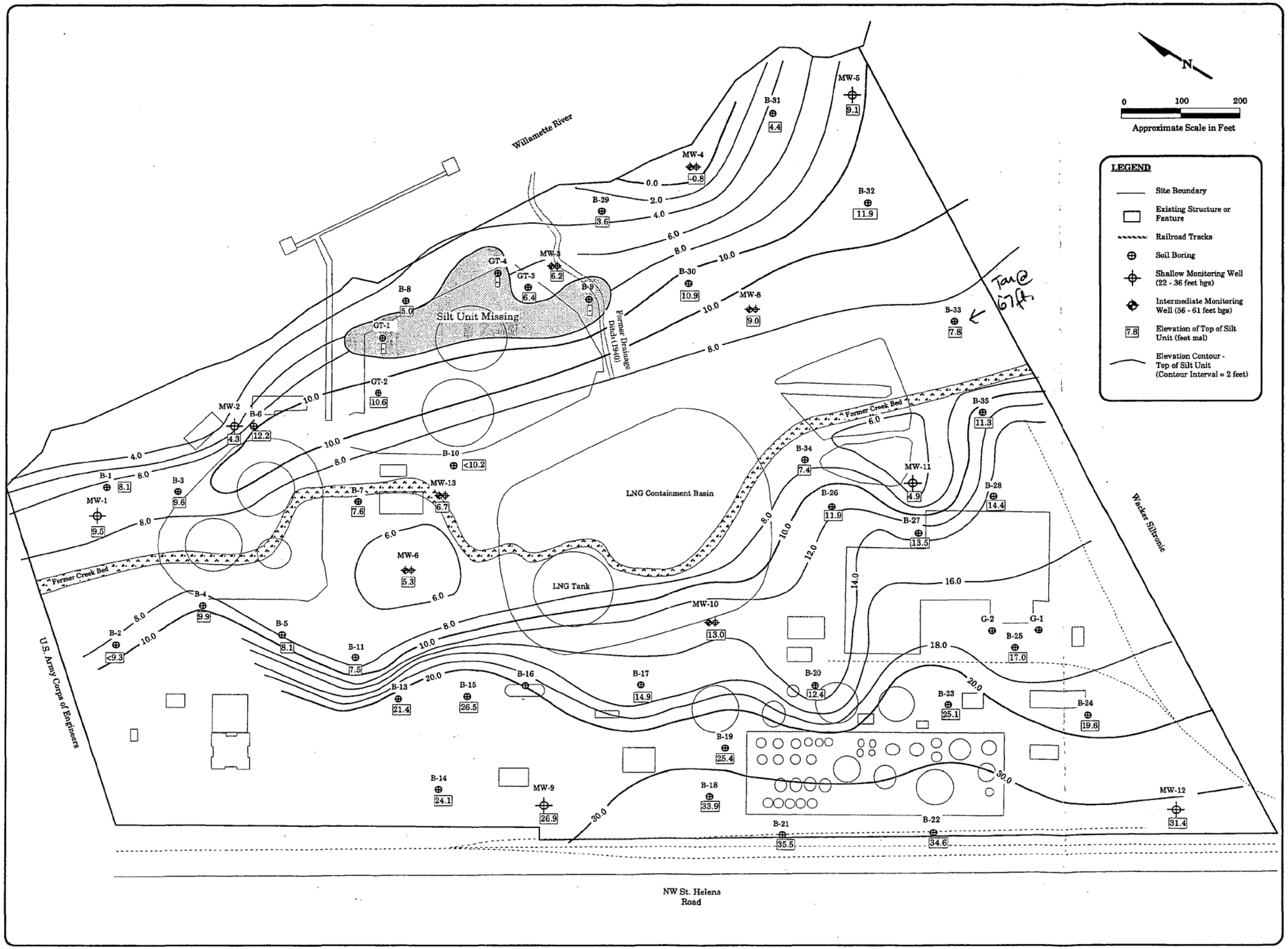

Figure 6

Elevation Map: Top of Silt Unit

Remedial Investigation
Northwest Natural Gas Company Gasco Facility
7990 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES
INCORPORATED
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project No. 2708

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**	**M-11**		
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/4-inch OD Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	13:17	10:30
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT #: 2708	DRILLER:	Brad James	2-Nov-95	3-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		

BORING DIAMETER:	10-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	35.4 feet MSL
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
	M11-01	1315	-	106						Surface: Sandy Silty GRAVEL - brown, slightly moist, grass covered area.
							1		GP	
Bentonite Chips							2			
							3			
					18	100	4			SAND with gravel (3.5-4.0 Feet bgs) - brown, loose, moist, coarse grained, pieces of brick
	M11-02	1330		-	27	100			SP	SAND with lampblack (4.0-5.0 feet bgs) - black, loose, hydrophobic, hydrocarbon odor, no sheen.
			11.5		21	70	5			
					14	100				Sandy GRAVEL (5.0-6.5 feet bgs) - black (Lampblack), no sheen, pieces of brick, large pieces of slag looking material .
					8	100	6		GP	
					7	30				
							7			
					8	100	8		SP	SAND with gravel (7.5-9.0 feet bgs) - black (Lampblack), pieces of brick, slag looking material (blue coloration), black, moist, hydrocarbon odor, no sheen.
	M11-03	1335		-	5	100				
			194		6	30	9			
							10			SAND (10.0-10.5 feet bgs) - Lampblack
20 % Solids Bentonite Grout							11			SAND (10.5-11.0 feet bgs) - brown, moist to wet, medium grained, loose, poorly graded, slight sheen.
							12			
							13			SAND (11.0-15.0 feet bgs) - black/metallic, moist to wet, strong hydrocarbon odor, sheen, brown froth via sheen test saturated with product, silt layers encountered at 12.5 and 13.5 feet bgs approximately 1 inch thick.
	M11-04	1350		-						
			2500+				14			
							15			
							16			SAND (15.0-20.0 feet bgs) - saturated with black oily product, wet, medium grained, loose, 2 inches of moist silt, olive grey with orange oxidation spots at 18.5 feet bgs.
	M11-05	1400		-			17			
			2500+							
							18		SP	
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**M-11**		
	HAI LOGGER:	Rob Ede		DRILL	DRILL
PROJECT:	SAMPLING METHOD:	3-inch Split Spoon/4-inch OD Core Barrel		START	FINISH
Northwest Natural Gas Co.	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger		Time:	Time:
Gasco Facility	EQUIPMENT TYPE	B-59 Mobile Drill		13:17	10:30
Portland, Oregon	DRILLER:	Brad James		Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		2-Nov-95	3-Nov-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	35.4 feet MSL
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
20 % Solids Bentonite Grout							21		SP	SAND (20.0-23.0 feet bgs) - wet, loose, medium grained, poorly graded, sheen on core, saturated with oily product.
							22			
	M11-06	1415		-						
			642				23			
							24		ML	SILT (23.0-25.0 feet bgs) - olive grey, moist, root zones, soft black viscous tarry material, some sand from 24-25 feet bgs.
							25			
							26		SP	SAND (25.0-30.0 feet bgs) - wet, medium-grained, poorly graded, loose, product saturated, froth via sheen test, saturated with product to 30.5 feet bgs.
							27			
							28			
	M11-07	1425		-						
			1511				29			
							30			
							31		ML	SILT (30.5-35.0 feet bgs) - green to grey, brown, moist, stiff, plastic (some clay content), oily product migrations through root zones/fractures.
							32			
	M11-08	1435		-			33			
			996				34			
							35			
							36		ML	SILT (35.0-40.0 feet bgs) - green, moist, stiff, plastic (some clay content), no product observed within core, root zones clean, slight sheen.
							37			
							38			
							39			
	M11-09	1450		7.9						
			29.3				40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**M-11**		
PROJECT:	HAI LOGGER:	Rob Ede		DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/4-inch OD Core Barrel		Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger		13:17	10:30
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill		Date:	Date:
PROJECT #: 2708	DRILLER:	Brad James		2-Nov-95	3-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.			

BORING DIAMETER:	10-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	35.4 feet MSL
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							41			SILT (40.0-45.0 feet bgs) - olive grey, moist, stiff, root zones present, no product observed, no sheen via sheen test.
							42			
							43		ML	
	M11-10	1500		10.9			44			
			23.1				45			
							46			SILT (45.0-49.0 feet bgs) - olive grey, moist, stiff, root zones present, no product, no sheen, large 6-inch tree limb/trunk at 45 feet bgs.
							47			
20 % Solids Bentonite Grout							48			
							49			
	M11-11	1513		-						Sandy SILT (49.0-50.0 feet bgs) - as above.
			-				50			
							51			Sandy SILT (50.0-51.0 feet bgs) - olive grey, soft, moist to wet, sheen?.
							52			SILT (51.0-53.0 feet bgs) - olive grey, moist, stiff, root zones, wood fragments.
							53			SILT (53.0-55.0 feet bgs) - green, slightly moist, stiff, no sheen.
							54			1540 - stop for day 11/3/95 - start drilling at 0825.
	M11-12	1524		-						
			-				55			
							56			SILT (55.0-60.0 feet bgs) - green, slightly moist, stiff, no sheen, no product, 6-inch sandy silt zone at 58 feet bgs.
							57			
							58		ML	
	M11-13	840		-						
			3.8				59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**SOIL BORING NUMBER**		**M-11**		
	HAI LOGGER:	Rob Ede		DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	3-inch Split Spoon/4-inch OD Core Barrel			
Northwest Natural Gas Co.	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger		Time:	Time:
Gasco Facility	EQUIPMENT TYPE	B-59 Mobile Drill		13:17	10:30
Portland, Oregon	DRILLER:	Brad James		Date:	Date:
PROJECT #: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations, Inc.		2-Nov-95	3-Nov-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	Not Applicable
SURFACE ELEVATION:	35.4 feet MSL
TOP OF CASING ELEVATION:	Not Applicable

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
20 % Solids Bentonite Grout							61		ML	Sandy SILT (60.0-65.0 feet bgs) - olive grey, moist, stiff, sheen on outside of core from water in hole, no sheen inside core.
							62			
							63			
							64			Sandy SILT (65.0-67.5 feet bgs) - olive grey, moist, stiff, sheen on outside of core from water in hole, no sheen inside core, approximately 1/4-inch of sand in end of core.
							65			
							66			Silty SAND (66.0-66.5 feet bgs) - olive grey,wet, moderately dense, no sheen.
	M11-14	1020		-					SM	
			7.8				67		ML	
							68		SM	SAND (67.5-68.5 feet bgs) - brown, wet, moderately dense, no sheen, fine grained.
							69		SP	SAND (68.5-70.0 feet bgs) - brown, wet, loose, poorly graded, no sheen, fine grained.
	M11-15	1030		-						
			2.3				70			
							71			Boring terminated at 70.0 feet bgs.
							72			*Sample prefix is 2708-951102-
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-4-35** OWRD # 84230			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Not Sampled		
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	10:30	13:17
	DRILLER:	Brad James	Date:	Date:
PROJECT: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations	31-Oct-95	31-Oct-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.70 feet MSL
TOP OF CASING ELEVATION:	34.54 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
	Steel Monument						-3			
							-2			
							-1			Ground surface
Concrete										See boring log for well MW-4-57 for soil description.
							1			
							2			
							3			
2-inch ID PVC Casing							4			
							5			
							6			
							7			
Bentonite Chips							8			
							9			
							10			
							11			
							12			
2-inch ID Stainless Steel Casing							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-4-35** **OWRD # 84230**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Not Sampled		
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	10:30	13:17
PROJECT: 2708	DRILLER:	Brad James	Date:	Date:
	DRILLING CONTRACTOR:	Geo-Tech Explorations	31-Oct-95	31-Oct-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.70 feet MSL
TOP OF CASING ELEVATION:	34.54 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite							21			
Blank Stainless Steel Casing							22			
							23			
							24	10/31/95		
							25	▽		Boring terminated at 35.0 feet bgs Monitoring well installed to 35.0 feet bgs
Colorado 10-20 Sand Pack							26			Materials: 10 feet 2-inch diameter, 0.010-inch stainless steel slotted screen 14 feet 2-inch diameter stainless steel blank casing 8 feet 2-inch diameter PVC blank casing 11 50# bags 10/20 sand 14 50# bags bentonite chips 1 end cap 1 locking cap above-grade steel monument 3 guard posts
2-inch ID 0.020-inch Stainless Steel Continuous Slot Screen							27			
							28			
							29			
							30			
							31			* Sample Prefix Number is 2708-951031-
							32			
							33			
							34			
Cap							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER**		**MW-4-57**	
	OWRD # 84229			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel		
Northwest Natural Gas Co.	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Gasco Facility	EQUIPMENT TYPE	B-59 Mobile Drill	10:15	13:15
Portland, Oregon	DRILLER:	Brad James	Date:	Date:
PROJECT: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations	30-Oct-95	30-Oct-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.7 feet MSL
TOP OF CASING ELEVATION:	34.53 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
	Steel Monument						-3			
							-2			
							-1			Ground surface
Concrete	M4-01	1005	1.9	195						Surface: Silty SAND with gravel - brown, moist, pieces of brick, grass covered area, no hydrocarbon odor, no sheen.
							1		SM	
							2			
Bentonite; 2-inch ID Blank PVC Casing					50/5.5"	60	3			Silty Sandy GRAVEL (2.5 feet bgs) - brown, moist, well graded, no hydrocarbon odor, no sheen.
							4		GM	
							5			
					23	70				Sandy GRAVEL (5.0-6.5 feet bgs) - dry, loose, poorly graded, no hydrocarbon odor, no sheen.
					27	0	6			
					27	0			GP	
							7			
	M4-02	1035		-	4	100	8		GM	Silty GRAVEL with sand (7.5-8.5 feet bgs) - brown, moist, well graded, no hydrocarbon odor, no sheen.
			2.8		50/5.5"	50				
							9			Concrete (8.5-9.5 feet bgs)
					38	0	10			
							11		GM	
							12			
Bentonite Slurry; 2-inch ID Blank Stainless Steel Casing					7	0	13			No recovery (12.5-14.5 feet bgs)
					6	0				
					6	0	14			
					5	0				
							15			
	M4-03	1104	-	-	2	100				Silty GRAVEL with sand (15.0-16.5 feet bgs) - olive grey with some black staining, wet, well graded, slight hydrocarbon odor, slight sheen.
					4	0	16			
					5	0				
							17			Silty GRAVEL with sand (16.5-20 feet bgs) - as above, moist, hydrocarbon odor, slight sheen, pieces of brick, switch to core barrel sampler.
							18			
	M4-04	1110		-						
			10.2				19		GM	
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-4-57** **OWRD # 84229**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	10:15	13:15
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	30-Oct-95	30-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.7 feet MSL
TOP OF CASING ELEVATION:	34.53 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Slurry; 2-inch ID Blank Stainless Steel Casing	M4-05	1115	7.0	-			21, 22, 23, 24, 25		ML	SILT with sand and gravel (20.0-25.0 feet bgs) - brown, moist, slightly plastic, no hydrocarbon odor, no sheen.
	M4-06	1135	10.2	3,261			26, 27		SM	Silty SAND (25.0-27.0 feet bgs) - olive grey, moist to wet, wood fragments, hydrocarbon odor, sheen.
							28		ML	Sandy SILT (27.0-28.0 feet bgs) - olive grey with brown and orange oxidation spots, root zones, no hydrocarbon odor, no sheen.
	M4-07	1140	2.1	-			29, 30	10/30/95	SM	Silty SAND (28.0-30.0 feet bgs) - olive grey with brown mottling, moist to wet, fine grained, root zones, no hydrocarbon odor, no sheen.
	M4-08	1150	2.4	-			31, 32		SP	SAND (30.0-32.5 feet bgs) - olive grey, wet, loose, poorly graded, fine grained, root zones, hydrocarbon odor, sheen.
							33		ML	SILT (32.5-33.0 feet bgs) - brown with orange oxidized zones, moist, slightly plastic, no hydrocarbon odor, no sheen.
	M4-09	1155	2.6	-			34		SM	Silty SAND (33.0-33.5 feet bgs) - brown with bright orange oxidized zones, moist to wet, dense, fine grained.
							35, 36, 37, 38, 39		ML	SILT (33.5-35.0 feet bgs) - olive grey, moist, stiff, no hydrocarbon odor, no sheen. SILT with fine sand (35.0-39.0 feet bgs) - olive grey, moist, stiff, root zones, no hydrocarbon odor, no sheen.
	M4-10	1210	-	-			40		SP	SAND (39.0-40.0 feet bgs) - olive grey, wet, loose, medium grained, no hydrocarbon odor, no sheen.

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-4-57** OWRD # 84229			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	10:15	13:15
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	30-Oct-95	30-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.7 feet MSL
TOP OF CASING ELEVATION:	34.53 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chip Seal							41		SP	SAND (40.0-44.0feet bgs) - as above, no hydrocarbon odor, no sheen.
							42			
							43			
20/40	M4-11	1220		-						
			8.7				44			
2-inch ID Blank Stainless Steel Casing									ML	Sandy SILT (44.0-45.0 feet bgs) - olive grey, moist, stiff, slightly plastic, no hydrocarbon odor, no sheen.
	M4-12	1225	-	-			45			
							46		SP	SAND (45.0-49.0 feet bgs) - olive grey, wet, loose, medium grained, no hydrocarbon odor, no sheen, thin silt layers from 49.0-50.0 feet bgs.
							47			
	M4-13	1238		-			48			
			31.9				49			
Colorado 10-20 Sand Pack							50			
2-inch ID 0.020-inch Stainless Steel Slotted Screen							51			SAND (50.0-55.0 feet bgs) - as above, no hydrocarbon odor, no sheen.
							52			
							53			
							54			
	M4-14	1245		-						
			178				55			
							56			SAND (55.0-58.0 feet bgs) - as above, no hydrocarbon odor, no sheen.
Cap							57		SP	
	M4-15	1312		0.26						
			17.5				58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-4-57** OWRD # 84229			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	10:15	13:15
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	30-Oct-95	30-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	31.7 feet MSL
TOP OF CASING ELEVATION:	34.53 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
							61		
							62		
							63		
							64		
							65		
							66		
							67		
							68		
							69		
							70		
							71		
							72		
							73		
							74		
							75		
							76		
							77		
							78		
							79		
							80		

SOIL DESCRIPTION

Boring terminated at 58.0 feet bgs
Boring sampled to 58.0 feet
Monitoring well installed to 58.0 feet bgs

Materials:
10 feet 2-inch diameter, 0.010-inch stainless steel slotted screen
40.5 feet 2-inch diameter stainless steel blank casing
5.5 feet 2-inch diameter PVC blank casing
13 50# bags 10/20 sand
5 50# bags bentonite chips
1 end cap
1 locking cap
above-grade steel monument
3 guard posts

* Sample Prefix Number is 2708-951030-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** OWRD # 84228	**MW-5-32**	
PROJECT:	HAI LOGGER: Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD: Split Spoon/Core Barrel		
Gasco Facility	DRILLING METHOD: 6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Portland, Oregon	EQUIPMENT TYPE B-59 Mobile Drill	13:03	15:00
PROJECT: 2708	DRILLER: Brad James	Date:	Date:
	DRILLING CONTRACTOR: Geo-Tech Explorations	27-Oct-95	27-Oct-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	25.1 feet MSL
TOP OF CASING ELEVATION:	28.05 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete	M5-01	1306		1.4						Surface: Silty GRAVEL - brown, moist, well graded, no hydrocarbon odor, no sheen.
			1107				1			
							2		GP	
					50/5"	50	3			GRAVEL (2.5-3.0 feet bgs) - grey, damp, loose, poorly graded, no hydrocarbon odor, no sheen.
							4			
							5			
	M5-02	1320		-	10	100				
			874		6	0	6			Silty GRAVEL (5.0-6.0 feet bgs) - brown, moist, well graded, no hydrocarbon odor, no sheen.
					26	0		10/27/95	GM	
							7			
							8			GRAVEL (7.5-9.0 feet bgs) - brown, wet, loose, well graded, no hydrocarbon odor, no sheen.
					10	30				
					15	0	9			
3/8-inchBentonite Chips					19	0				
2-inch ID Blank PVC Casing							10			
	M5-03	1330		-	8	100			GP	GRAVEL with coarse sand and silt (10.0-13.0 feet bgs) - brown, wet, no hydrocarbon odor, no sheen.
			279		5	0	11			
					5	0				Switch to core barrel sampler.
					↑	↑	12			
	M5-04	1340		-			13			
			383			↓				SAND with lampblack (13.0-15.0 feet bgs) - black, dry, hard, fine grained, hydrophobic, hydrocarbon odor.
							14			
					↓		15			
					↑	↑				
	M5-05	1350		1,942		↓	16		SP	SAND (15.0-20.0 feet bgs) - dark grey, moist, medium dense, poorly graded, fine grained, pieces of bark, hydrocarbon odor?, olive grey sandy silt on core bottom.
			81.1							
							17			
							18			
							19			
					↓		20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-5-32** OWRD # 84228			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	13:03	15:00
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	27-Oct-95	27-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	25.1 feet MSL
TOP OF CASING ELEVATION:	28.05 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Colorado 10-20 Sand Pack	M5-06	1357		-						Sandy SILT (20.0-22.0 feet bgs) - brown with orange mottling, moist, non-plastic, no hydrocarbon odor, no sheen, some root zones.
			117				21		ML	
	M5-07	1400	18.1	0.91			22			SAND (22.5-22.5 feet bgs) - brown, wet, fine grained, no hydrocarbon odor, no sheen.
							23			SAND (22.5-23.5 feet bgs) - as above, no hydrocarbon odor, no sheen.
							24			Silty SAND (23.5-25.0 feet bgs) - brown with orange oxidation spots, wet, loose, no hydrocarbon odor, no sheen.
2-inch ID 0.020-inch PVC Slotted Screen	M5-08	1406		-						
			62.1				25		SP	SAND (25.0-26.5 feet bgs) - brown with orange oxidation spots, wet, loose, fine grained, some thin silt layers no hydrocarbon odor, no sheen.
							26			SAND (26.5-27.5 feet bgs) - olive grey, wet, loose, poorly graded, some thin silt layers, no hydrocarbon odor, no sheen.
							27			
							28			SAND with thin silt layers (27.5-30.0 feet bgs) - olive grey, wet, loose, no hydrocarbon odor, no sheen.
	M5-09	1425		-			29			
			177				30			
					1	100				SAND with thin silt (30.0-32.0 feet bgs) - olive grey, wet, loose, poorly graded, fine grained, no hydrocarbon odor, no sheen.
					3	100	31			
Cap					4	100				
	M5-10	1448		ND	4	70	32			
			29.4							Boring terminated at 32.0 feet bgs Boring sampled to 32.0 feet Monitoring well installed to 32.0 feet bgs
							33			
							34			Materials: 10 feet 2-inch diameter, 0.020-inch PVC slotted screen 21 feet 2-inch diameter PVC blank casing 12.5 50# bags 10/20 sand 10 50# bags 3/8-inch bentonite chips 1 end cap 1 locking cap above-grade steel monument 3 guard posts
							35			
							36			
							37			
							38			* Sample Prefix Number is 2708-951027-
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-29** **OWRD # 84226**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Not Sampled	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	8:30	11:15
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	26-Oct-95	26-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.09 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
	Steel Monument						-3			
							-2			
							-1			Ground surface
Concrete; 2-inch ID Blank PVC Casing							1			See boring log for well MW-8-56 for soi description.
							2			
							3			
3/8-inch Bentonite Chips; 2-inch ID Blank Stainless Steel Casing							4			
							5			
							6			
							7			
							8			
							9			
							10			
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
Colorado 10-20 Sand Pack							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-29** **OWRD # 84226**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Not Sampled	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	8:30	11:15
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobile Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	26-Oct-95	26-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.09 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Colorado 10-20 Sand Pack							21			
	2-inch ID 0.020-inch Stainless Steel Slotted Screen						22			
							23			
							24			
							25			
							26			
							27			
							28			
	Cap						29			
							30			Boring terminated at 29.0 feet bgs Monitoring well installed to 29.0 feet bgs
							31			Materials: 10 feet 2-inch diameter, 0.010-inch stainless steel slotted screen 13 feet stainless steel blank casing 3 feet 2-inch diameter PVC blank casing 12 50# bags 10/20 sand 13 50# bags 3/8-inch bentonite chips 1 end cap 1 locking cap above-grade steel monument 3 guard posts
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-56** **OWRD # 84226**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	905	1410
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	25-Oct-95	25-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.13 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete; 2-inch ID Blank PVC Casing	M8-01	900	5.9	281						
							1		SM	Surface: Silty SAND with gravel - brown, moist, no hydrocarbon odor, no sheen.
							2			
					6	100	3			Tarry GRAVEL - black, moist, strong hydrocarbon odor, liquied-viscous tar from 5-6.5 feet bgs, sand and silt mix from 8.5-10.5 feet bgs.
					15	0				
					29	0	4			
2-inch ID Blank Stainless Steel Casing							5			
	M8-02	915		-	6	100				
			84.8		7	20	6			
					12	0			GP	
							7			
							8			
	M8-03	945	-	-	5	100	9			
					9	10				
					10	0	10			
					8	100				
					15	100	11			Silty GRAVEL (10.5-11.5 feet bgs) - brown and tan mottled, some black staining, moist, hydrocarbon odor.
					13	0				
							12			
							13			Silty GRAVEL (12.5-13.0 feet bgs) - olive grey, moist, slight hydrocarbon odor, no sheen.
3/4-inch Bentonite Chips	M8-04	1002	-	-	10	100				Silty GRAVEL (13.0-14.0 feet bgs) - loose, pieces of brick, moist, slight hydrocarbon odor, no sheen.
					11	100	14			
					13	50				
							15		GM	
					↕	0				No Recovery (15.0-16.0 feet bgs).
					↕	0	16	10/25/95		
					11					Silty GRAVEL (16.0-17.0 feet bgs) - black, hydrophobic, lampblack?, poor recovery.
					50/1"		17			
					↕	↕	18			Silty GRAVEL (17.5-20.0 feet bgs) - brown, wet, no hydrocarbon odor, no sheen, brick and wood fragments.
	M8-05	1025	-	-			19			
					↕	↕	20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-56** OWRD # 84226			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel		
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	905	1410
	DRILLER:	Brad James	Date:	Date:
PROJECT: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations	25-Oct-95	25-Oct-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.13 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/4-inch Bentonite Chips; 2-inch ID Blank Stainless Steel Casing							21		GM	Silty GRAVEL (20.0-22.0 feet bgs) - brown, wet, brick and wood fragments, no hydrocarbon odor, no sheen.
	M8-06	1034		-			22			
			5.0						SP	SAND (22.0-25.0 feet bgs) - black, wet, loose, coarse grained, lampblack throughout, hydrocarbon odor, sheen, becoming solid and brittle with a slight sheen from 23.0-23.3 feet bgs.
	M8-07	1044		-	9	100	23			
			13.3		50/3"	100			lampblack	
							24			
							25			
							26		ML	Tarry SILT (25.0-27.5 feet bgs) - black, wet, stiff, mostly tar, strong sheen, vegetation throughout sample.
	M8-08	1115		-						
			225				27			
							28			SILT (27.5-30.0 feet bgs) - olive grey, moist, stiff, vegetation, tar within root zones, sheen.
							29			
							30			
							31			SILT (30.0-35.0 feet bgs) - olive grey, moist, stiff, semi-viscous tar within root zones.
							32			
							33			
							34			
	M8-09	1134		-						
			81.5				35			
3/4-inch Bentonite Chips; 2-inch ID Blank Stainless Steel Casing							36			Sandy SILT (35.0-40.0 feet bgs) - brown, orange-mottled, moist, stiff, tar within root zones.
							37			
							38		ML	
	M8-10	1152	-	-			39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-56** **OWRD # 84226**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	905	1410
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	25-Oct-95	25-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.13 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
3/4-inch Bentonite Chips							41		ML	Sandy SILT (40.0-42.0 feet bgs) - as above.
2-inch ID Blank Stainless Steel Casing							42		SP	SAND (42-42.3 feet bgs) - olive grey, medium grained, black product saturated, less viscous than tar.
							43		ML	SILT (42.3-42.8 feet bgs) - olive grey, medium grained, black product saturated.
							44			
	M8-11	1202	112	8.1			45		SP	SAND (42.8-45 feet bgs) - olive grey, wet, loose, poorly graded, medium grained, no product, slight sheen.
Colorado 10-20 Sand Pack							46			SAND (45.0-47.5 feet bgs) - olive grey, wet, loose, poorly graded, medium grained, no sheen.
	M8-12	1245		-			47			
			43.7				48			SAND (47.5-50.0 feet bgs) - olive grey, wet, loose, poorly graded, medium grained, some thin silt layers, no sheen.
2-inch ID 0.020-inch Stainless Steel Slotted Screen							49			
	M8-13	1314	-	-			50			
							51			SAND (50.0-54.0 feet bgs) - as above, no hydrocarbon odor, no sheen.
	M8-14	1320	-	-			52			
							53			
							54			
							55		SP	SAND (54.0-56.0 feet bgs) - as above, no hydrocarbon odor, no sheen.
Cap	M8-15	1400	-	0.64			56			
							57			
							58			
							59			
							60			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-8-56** **OWRD # 84226**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	3-inch Split Spoon/Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	905	1410
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	25-Oct-95	25-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.13 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							61			Boring terminated at 56.0 feet bgs Boring sampled to 56.0 feet Monitoring well installed to 56.0 feet bgs Materials: 10 feet 2-inch diameter, 0.020-inch stainless steel slotted screen 40.5 feet 2-inch diameter stainless steel blank casing 4.5 feet 2-inch diameter PVC blank casing 11 50# bags 10/20 sand 26 50# bags bentonite chips 1 end cap 1 locking cap above-grade steel monument 3 guard posts * Sample Prefix Number is 2708-951025-
							62			
							63			
							64			
							65			
							66			
							67			
							68			
							69			
							70			
							71			
							72			
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER**	**MW-10-25**		
	OWRD # 84238			
	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
PROJECT:	SAMPLING METHOD:	Not Sampled		
Northwest Natural Gas Co.	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Gasco Facility	EQUIPMENT TYPE	B-59 Mobil Drill	9:00	10:00
Portland, Oregon	DRILLER:	Brad James	Date:	Date:
PROJECT: 2708	DRILLING CONTRACTOR:	Geo-Tech Explorations	9-Nov-95	9-Nov-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.22 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
	Steel Monument						-3			
							-2			
							-1			Ground surface
Concrete										See boring log for well MW-10-61 for soi description.
	2-inch ID Blank PVC Casing						1			
							2			
							3			
							4			
							5			
Bentonite Chips	2-inch ID Blank Stainless Steel Casing						6			
							7			
							8			
							9			
							10			
							11			
							12			
							13			
							14			
Colorado 10-20 Sand Pack							15			
	20-Slot Stainless Steel Continuous Screen						16			
							17			
							18			
							19			
							20			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-10-25** **OWRD # 84238**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	Not Sampled	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	9:00	10:00
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	9-Nov-95	9-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.22 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Colorado 10-20 Sand Pack; 20-Slot Stainless Steel Screen							21			
							22			
							23			
							24			
Cap							25			
							26			
							27			
							28			
							29			
							30			
							31			
							32			
							33			
							34			
							35			
							36			
							37			
							38			
							39			
							40			

Boring terminated at 25.0 feet bgs
Monitoring well installed to 25.0 feet bgs

Materials:
10 feet 2-inch diameter, 0.020-inch stainless steel slotted screen
5 feet 2-inch diameter PVC blank casing
9 feet stainless steel blank casing
11 bags 10/20 sand
6 50# bags bentonite chips
1 end cap
1 locking cap
above-grade steel monument
3 guard posts

* Sample Prefix Number is 2708-951109-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-10-61** OWRD # 84237			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	9:00	12:30
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	8-Nov-95	8-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.33 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete	M10-01	850	26.2	78.7						Silty Sandy GRAVEL - grey/brown, wet.
	M10-02	855	57.1	107			1			
2-inch ID Blank PVC Casing							2		GM	
							3			SAND (2.5-3.0 feet bgs) - brown, moist, poorly graded, loose, medium grained.
	M10-03	905		-			4		SP	SAND (3.0-4.0 feet bgs) - black, poorly graded, loose, medium grained, hydrocarbon odor, sheen.
			102				5			
Bentonite Grout Slurry							6			SAND with gravel (5.0-10.0 feet bgs) - black, moist, moderately dense, hydrocarbon odor, strong sheen, tar from 7-8 foot depth, lampblack present?, brick at 8 feet bgs.
	M10-04	920		-			7			
			566				8			
2-inch ID Blank Stainless Steel Casing							9			
							10			
							11			Tarry SAND with gravel (10.0-15.0 feet bgs) - wet oozing tar saturated sand and gravel from 10-12 feet bgs,very hard tar matrix from 12-15 feet bgs.
	M10-05	930		-						
			241				12		SP	
							13			
							14			
Bentonite Grout Slurry							15			
							16		ML	Tarry SILT with gravel (15.0-16.5 feet bgs) - black, moist, oozing tar, silts are saturated with oily tar, silts repel water.
							17			SAND (17.0-20.0 feet bgs) - olive grey, moist to wet, fine grained, product saturated (brown), froth via sheen, large piece of wood in end of sampling core.
							18			
							19	11/8/95	SP	
	M10-06	950		-						
			2500+				20	▽		

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-10-61** **OWRD # 84237**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	9:00	12:30
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	8-Nov-95	8-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.33 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout Slurry; 2-inch ID Blank Stainless Steel Casing							21		SP	SAND (20.0-23.5 feet bgs) - brown, wet, loose, poorly graded, medium grained, product saturated (oozes out of pore spaces)
	M10-07	1005		-			22			
			2500+				23			
							24			SILT (23.5-25.0 feet bgs) - brown, moist, stiff, root zones, no product, no sheen.
	M10-08	1010		-						
			1204				25		ML	SILT (25.0-30.0 feet bgs) - brown, moist, stiff, root zones, some black and brown spots (organic looking), no obvious product.
							26			
							27			
							28			
	M10-09	1018		0.76						
			943				29			
							30			
							31			SILT (30.0-35.0 feet bgs) - olive grey with orange spots, , root zones, no product, no sheen, poor sample recovery.
	M10-10	1025	-	-						
							32			
							33			
							34			
							35			
Bentonite Grout Slurry; 2-inch ID Blank Stainless Steel Casing							36			SILT (35.0-40.0 feet bgs) - olive grey to green, root zones, small piece of bark, no sheen.
	M10-11	1035	65.3	-						
	M10-12	1040	68.3	-			37			
							38		ML	
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-10-61** **OWRD # 84237**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	9:00	12:30
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	8-Nov-95	8-Nov-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.33 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Grout Slurry							41		ML	SILT (40.0-45.0 feet bgs) - olive grey to green (transition to green with depth), moist, stiff, non-plastic, slightly brittle from 44-45 feet bgs, root zones, bark, sandy silt from 43.5-44 feet bgs.
							42			
							43			
	M10-13	1050		-			44			
			220				45			
Bentonite Chip Seal							46			SILT (45.0-47.5 feet bgs) - olive green to 46.5 feet bgs, tan to 47.5 feet bgs, moist, hard/slightly brittle, no sheen.
							47			
20-40	M10-14	1115		-			48		SP	SAND (47.5-53.0 feet bgs) - tan, wet, loose, poorly graded, fine grained, no sheen, some muscovite from 50-53 feet bgs.
			61.3				49			
							50			
							51			
	M10-15	1145		-			52			
			62.3				53			
							54		ML	Sandy SILT (53.0-57.5 feet bgs) - tan, moist, medium stiff, interbedded with fine grained sands from 55.0-57.5 feet bgs.
							55			
							56			
	M10-16	1200		-						
			47.6				57			Tree trunk at 57.5 feet bgs surrounded by olive grey sands.
							58		SM	Silty SAND (57.5-60.0 feet bgs).
	M10-17	1210		-			59			
							60			

2-inch ID Blank Stainless Steel Casing

Colorado 10-20 Sand Pack

2-inch ID 0.020-inch Stainless Steel Continous Slotted Screen

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER** **MW-10-61** OWRD # 84237			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch Core Barrel		
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	Time:	Time:
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	9:00	12:30
PROJECT: 2708	DRILLER:	Brad James	Date:	Date:
	DRILLING CONTRACTOR:	Geo-Tech Explorations	8-Nov-95	8-Nov-95

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	36.5 feet MSL
TOP OF CASING ELEVATION:	39.33 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Cap							61			
							62			
							63			
							64			
							65			Boring terminated at 61.0 feet bgs Boring sampled to 60.0 feet Monitoring well installed to 61.0 feet bgs
							66			Materials: 10 feet 2-inch diameter, 0.010-inch stainless steel slotted screen 5 feet 2-inch diameter PVC blank casing 45 feet stainless steel blank casing 1 50# bags 20/40 sand 11 bags 10/20 sand 2 50# bags bentonite chips 5 bags bentonite grout 1 end cap 1 locking cap above-grade steel monument 3 guard posts
							67			
							68			
							69			
							70			
							71			
							72			* Sample Prefix Number is 2708-951108-
							73			
							74			
							75			
							76			
							77			
							78			
							79			
							80			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER MW-12-36** OWRD # 84224			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch OD Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	1410	1550
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	23-Oct-95	23-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	35.9 feet MSL
TOP OF CASING ELEVATION:	38.69 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Steel Monument							-3			
							-2			
							-1			Ground surface
Concrete	M12-01	1415	0.1	116			1		GP	Surface: Sandy GRAVEL (placed for ground cover) - moist, no hydrocarbon odor, no sheen.
							2			
	M12-02	1420		-					SP	SAND (2.0-4.5 feet bgs) - brown, moist, fine grained, loose, some thin silty zones present, no hydrocarbon odor, slight sheen.
			0.5				3			
							4			
Bentonite Chips; 2-inch ID Blank PVC Casing	M12-03	1428	3.9	-			5		ML	SILT (4.5-9.5 feet bgs) - moist to wet, olive grey, very soft, strong hydrocarbon odor, strong sheen.
							6			
							7			
							8			
							9			
							10			SILT (9.5-14.5 feet bgs) - olive grey/green mottled with orange spots (oxidized zones), moist, stiff, strong hydrocarbon odor, sheen, brown oil-like substance in upper 2 feet of core.
	M12-04	1440		-			11			
			46.3				12			
							13			
							14	10/23/95		
							15			
Bentonite Chips; 2-inch ID Blank PVC Casing	M12-05	1450		-			16		SP	SILT (14.5-15 feet bgs) - olive grey, brown mottled, stiff, strong hydrocarbon odor, sheen via sheen test. SAND (15-16.5 feet bgs) - brown, wet, fine grained, poorly graded, strong hydrocarbon odor, sheen.
			69.6				17			
							18		ML	SILT (16.5-19.5 feet bgs) - olive grey and brown mottled, stiff, strong hydrocarbon odor, sheen via sheen test, stained soil from 16.5-17.5 feet bgs.
							19			
							20		SP	

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER MW-12-36** **OWRD # 84224**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch OD Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	1410	1550
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	23-Oct-95	23-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	35.9 feet MSL
TOP OF CASING ELEVATION:	38.69 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
Bentonite							21		SP	SAND (19.5-24.5 feet bgs) - olive grey, wet, fine grained, sheen on core, hydrocarbon odor, loose, 1-inch silt layer encountered at 21.0 feet bgs, some product staining on silts.
							22			
2-inch ID Blank PVC Casing	M12-06	1458		8.6						
			72.4				23			
							24			
							25			SAND (24.5-29.5 feet bgs) - olive grey changing to brown with depth, wet, fine grained, loose, muscovite present, no hydrocarbon odor, no sheen.
							26			
	M12-07	1510		ND			27			
			1.0				28			
Colorado 10-20 Sand Pack							29			
2-inch ID 0.010-inch PVC Slotted Screen							30			SAND (30.0-34.5 feet bgs) - brown, wet, fine to medium grained, loose, no hydrocarbon odor, no sheen, muscovite present.
							31			
							32			
	M12-08	1530		-						
			0.7				33		SP	
							34			
							35			SAND (34.5-36.0 feet bgs) - brown, wet, medium grained, loose, no hydrocarbon odor, no sheen, muscovite present.
Cap	M12-09	1550	0.9	-			36			Bedrock encountered at 36 feet bgs (augers grinding on hard surface).
							37			
							38			
							39			
							40			

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717	**MONITORING WELL NUMBER MW-12-36** **OWRD # 84224**			
PROJECT:	HAI LOGGER:	Rob Ede	DRILL START	DRILL FINISH
Northwest Natural Gas Co.	SAMPLING METHOD:	4-inch OD Core Barrel	Time:	Time:
Gasco Facility	DRILLING METHOD:	6 1/4-inch ID Hollow Stem Auger	1410	1550
Portland, Oregon	EQUIPMENT TYPE	B-59 Mobil Drill	Date:	Date:
PROJECT: 2708	DRILLER:	Brad James	23-Oct-95	23-Oct-95
	DRILLING CONTRACTOR:	Geo-Tech Explorations		

BORING DIAMETER:	10-inch
CASING DIAMETER:	2-inch ID
SURFACE ELEVATION:	35.9 feet MSL
TOP OF CASING ELEVATION:	38.69 feet MSL

WELL CONSTRUCTION DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppm)	SPT (blows/0.5 feet)	RECOVERY (%)	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	SOIL DESCRIPTION
							41			Boring terminated at 36.0 feet bgs Boring sampled to 36.0 feet Monitoring well installed to 36.0 feet bgs Materials: 10 feet 2-inch diameter, 0.010-inch PVC slotted screen 10 feet 2-inch diameter PVC blank casing 16 50# bags 10/20 sand 14 50# bags bentonite chips 1 end cap 1 locking cap above-grade steel monument 3 guard posts * Sample Prefix Number is 2708-951023-
							42			
							43			
							44			
							45			
							46			
							47			
							48			
							49			
							50			
							51			
							52			
							53			
							54			
							55			
							56			
							57			
							58			
							59			
							60			

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February 22, 1999
Waste Management and Cleanup Division
Department of Environmental Quality

PHASE I REMEDIAL INVESTIGATION SUMMARY REPORT AND PRELIMINARY ANALYSIS OF SOIL DATA (As Appendix 1)

Volume 2

Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

October 9, 1998

Prepared for:

Northwest Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

and

Decision Management Associates LLC
Portland, Oregon
(Appendix 1)

HAI Project No. 2708

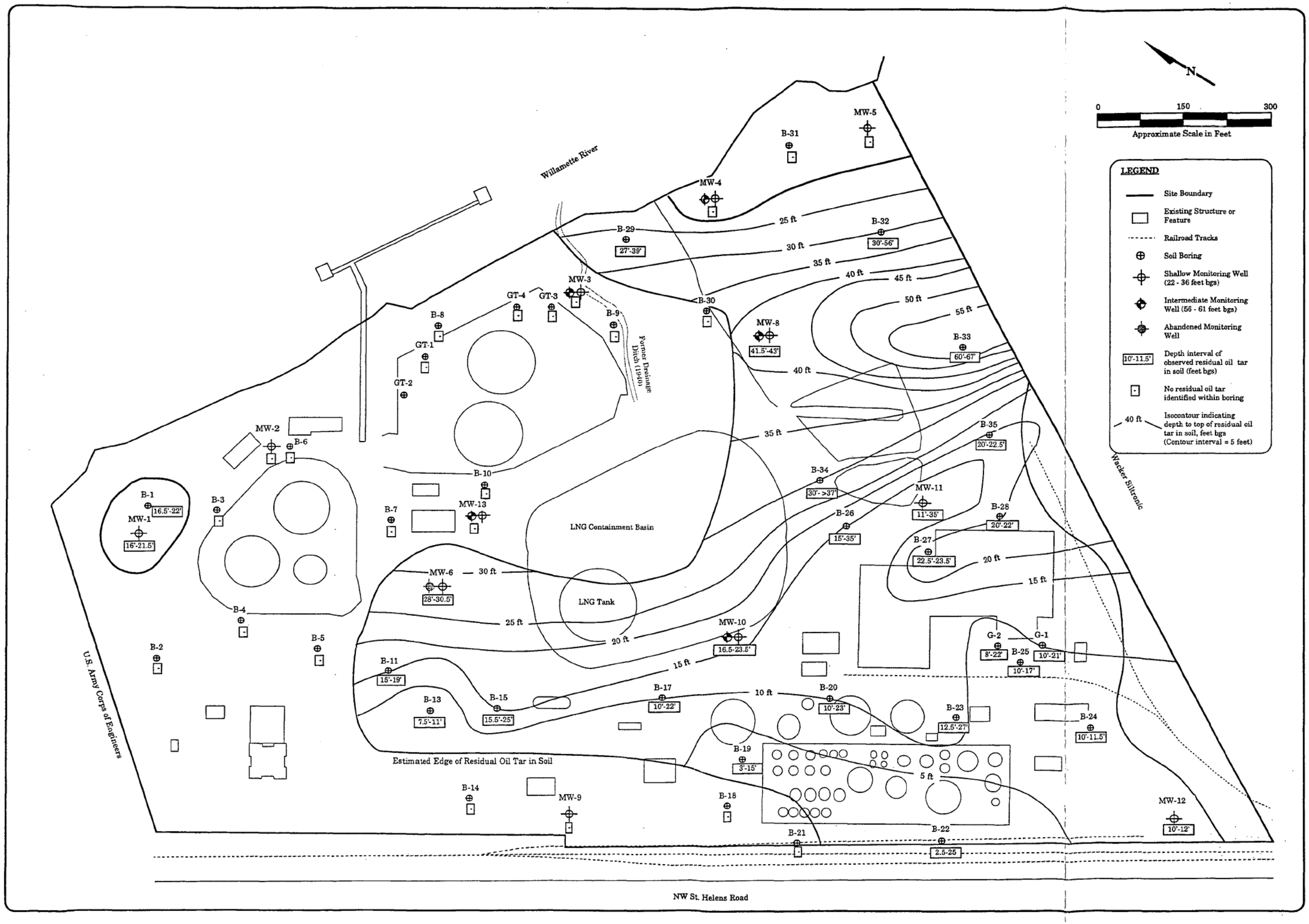

Figure
F-1

Residual Oil Tar/ DNAPL in Soil: Depth to Top (feet bgs)

Remedial Investigation
Northwest Natural - Gasco Facility
7540 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

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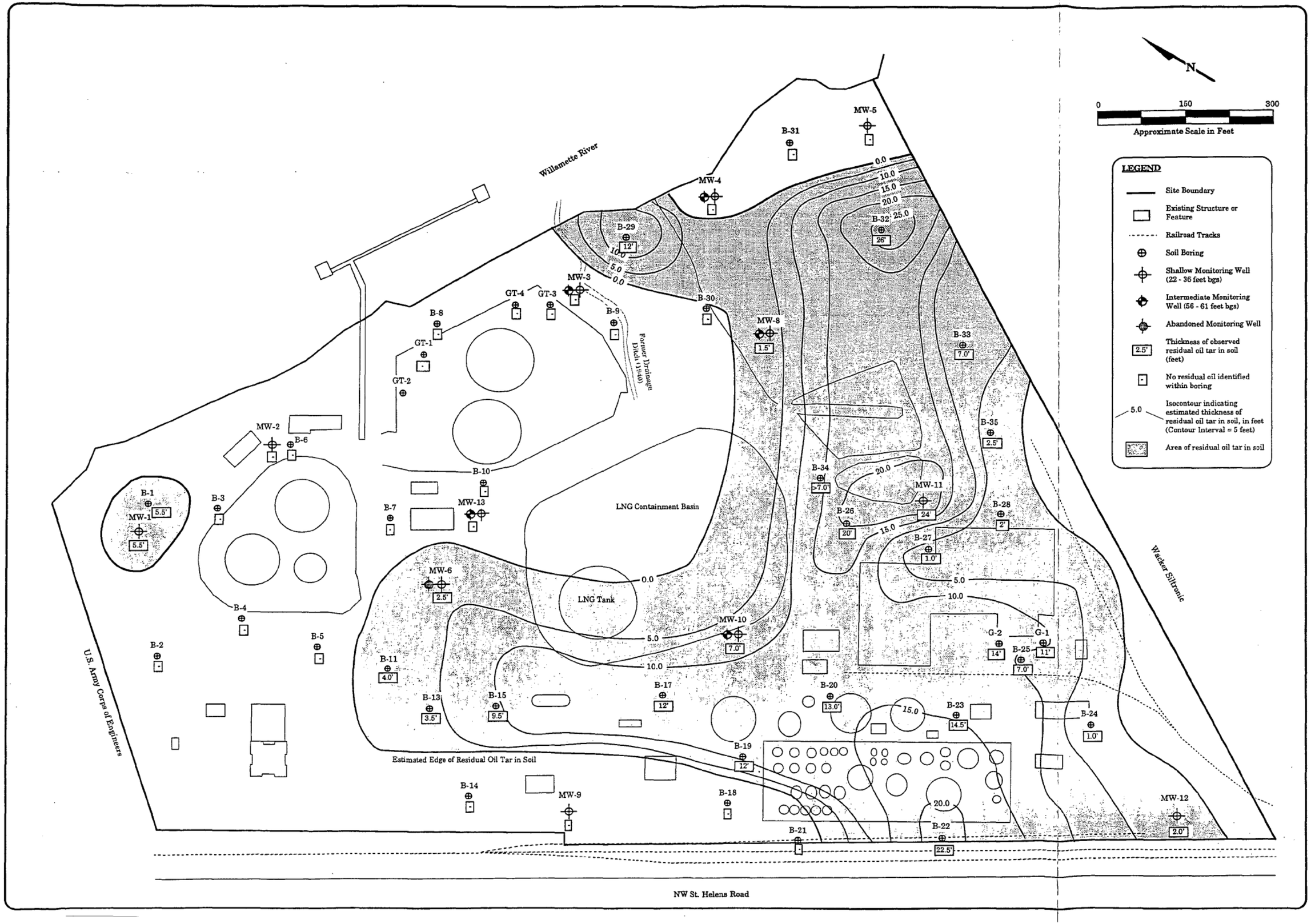

Figure
F-2

Residual Oil Tar/ DNAPL in Soil: Thickness and Isopach Map

Remedial Investigation
Northwest Natural - Gasco Facility
7540 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

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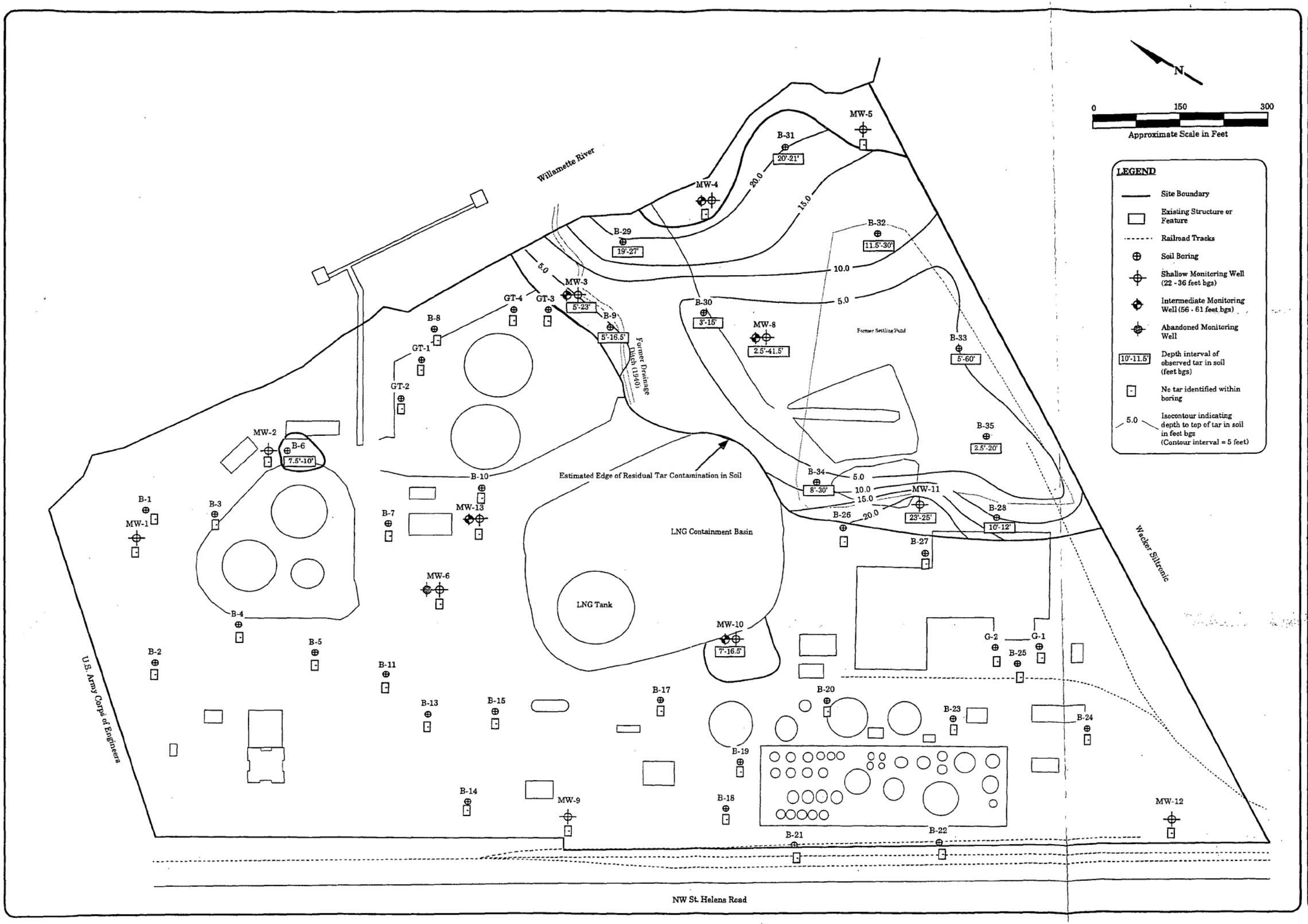

Figure
F-3

Tar in Soil: Depth to Top (feet bgs)

Remedial Investigation
Northwest Natural - Gasco Facility
7990 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

February 1998

Project #2708

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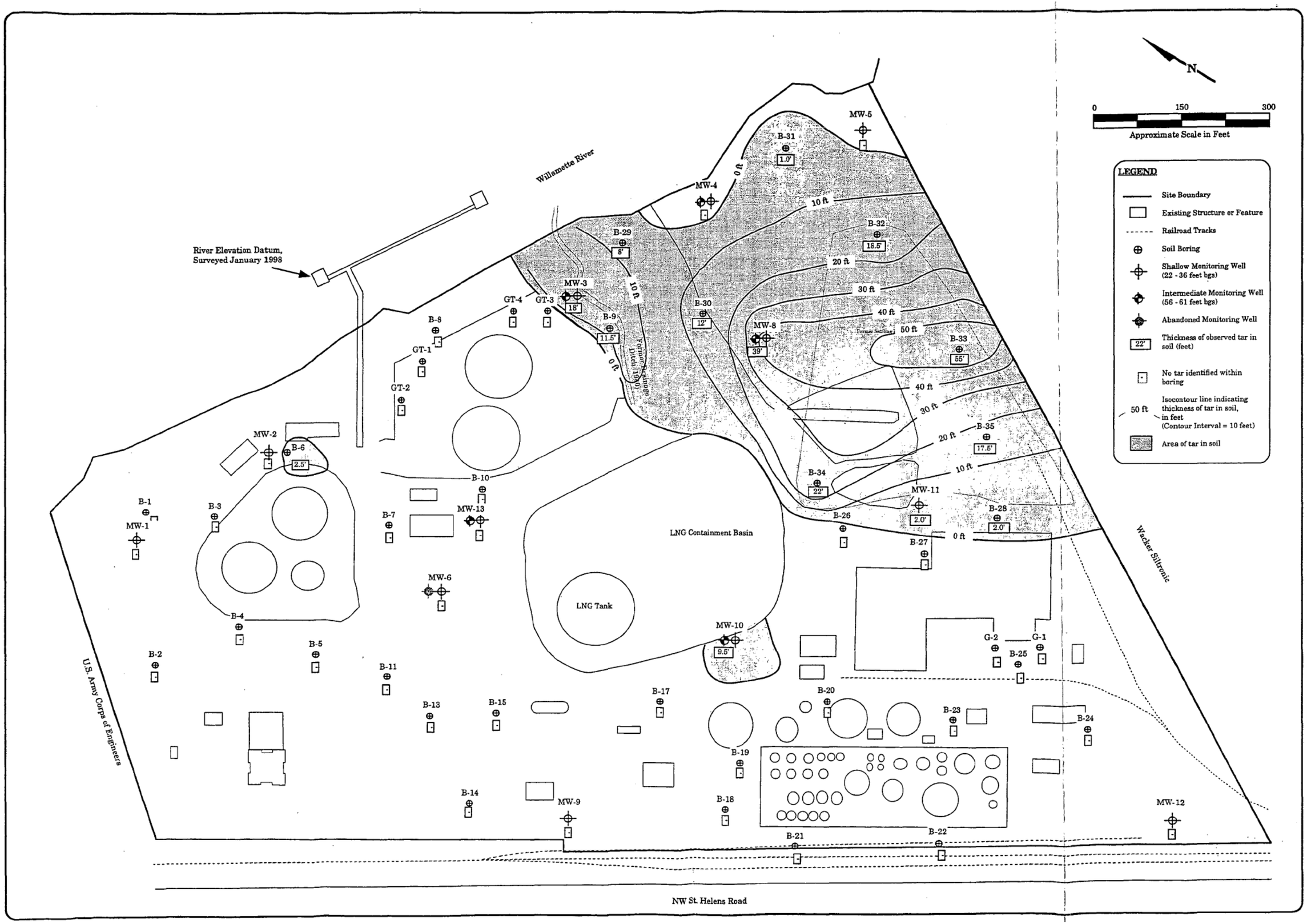

Figure
F-4

Tar in Soil: Thickness and Isopach Map

Remedial Investigation
Northwest Natural - Gasco Facility
7540 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

February 1998

Project #2708

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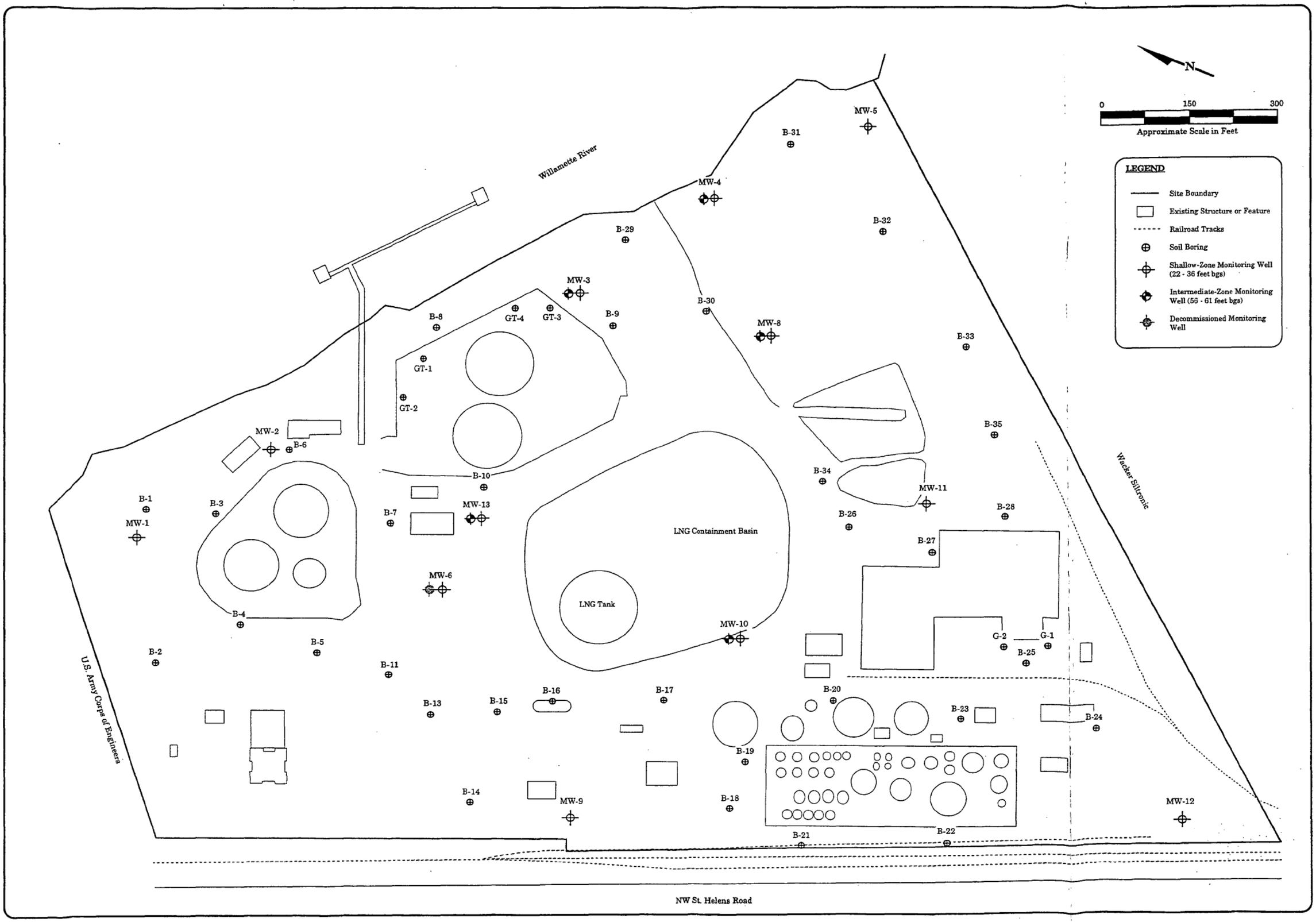

Figure
G-1

Monitoring Well and Soil Boring Location Map

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

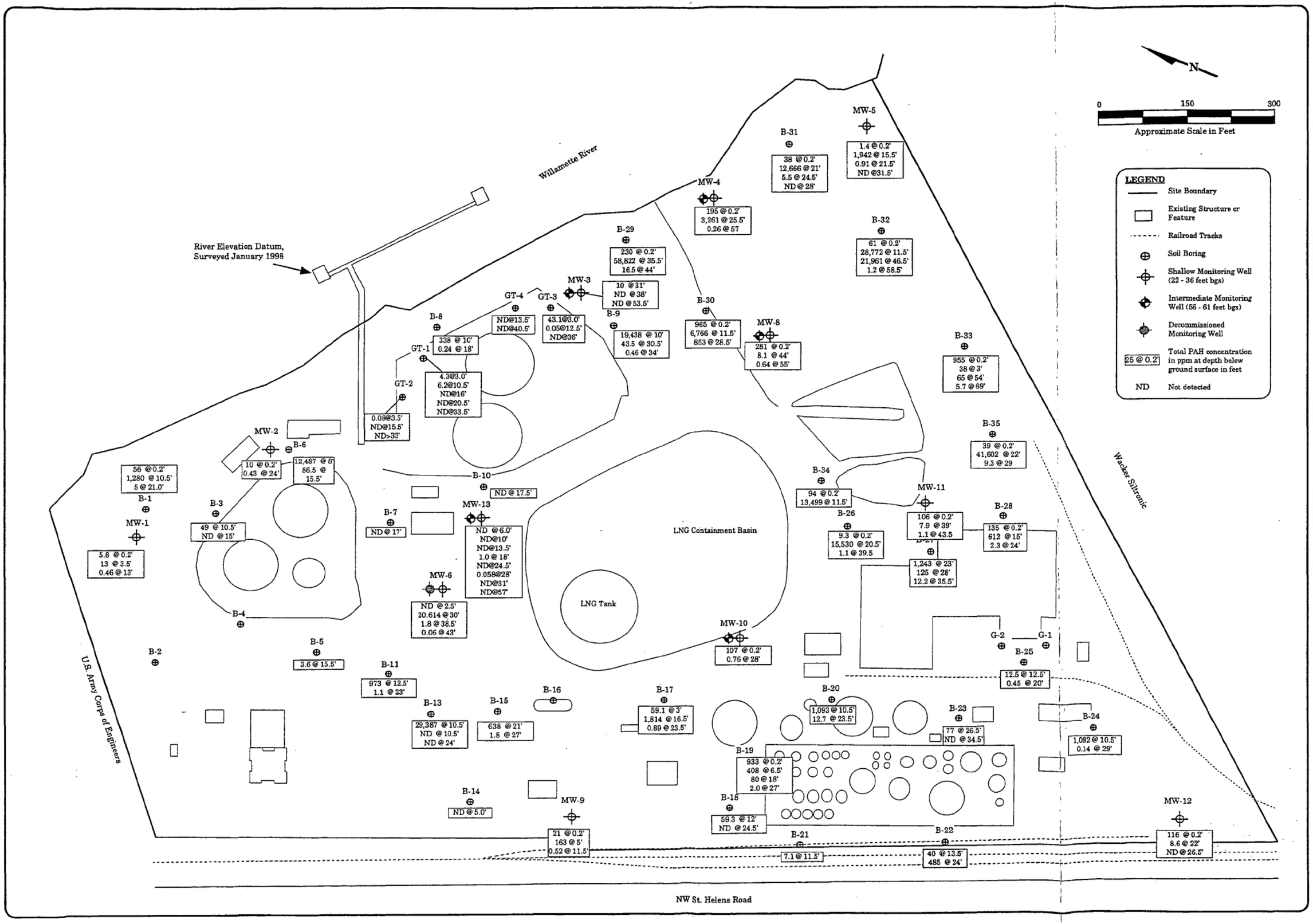

Figure G-2

Soil Sampling Results Map: Total PAHs

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

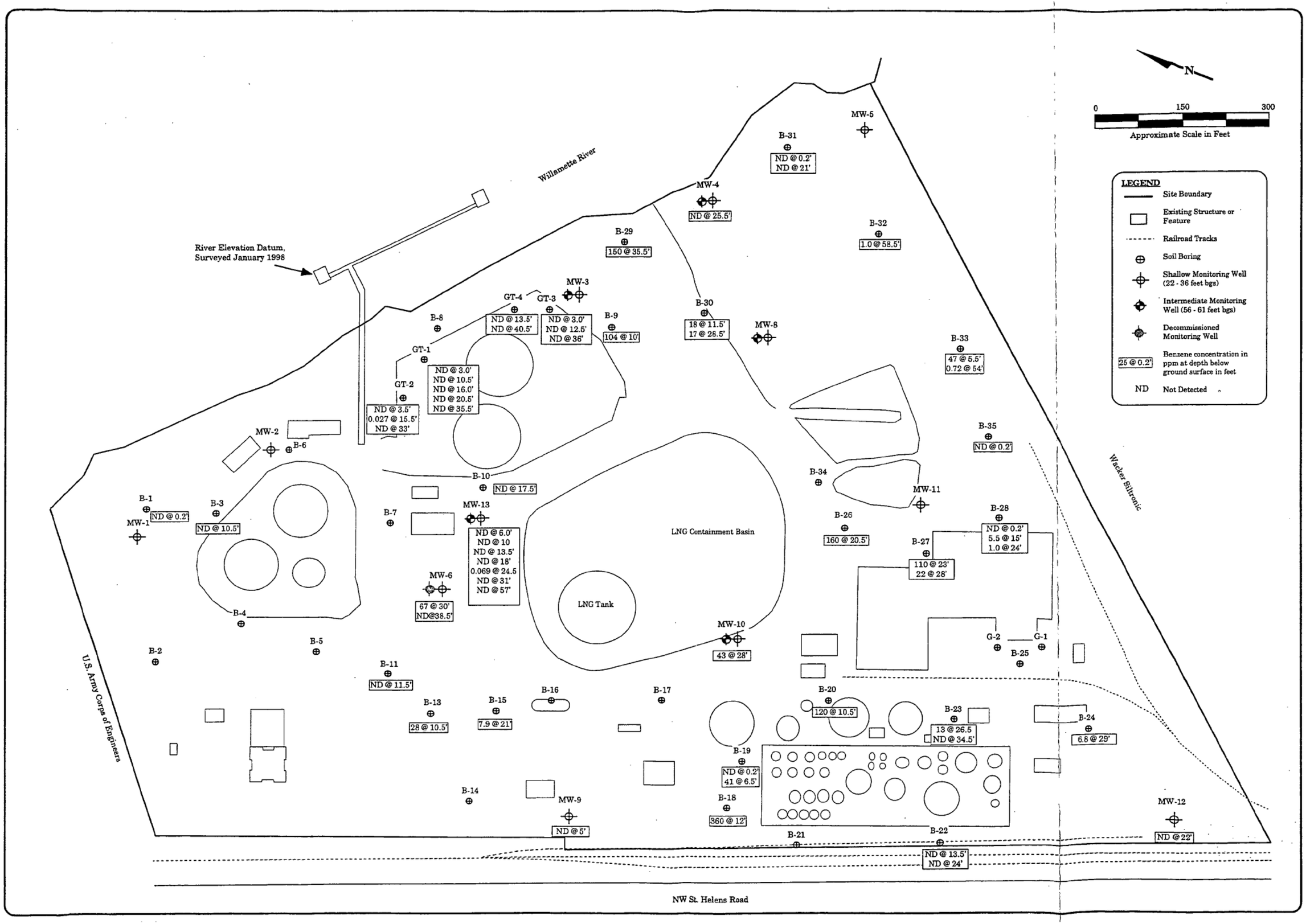

Figure G-3

Soil Sampling Results Map: Benzene

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

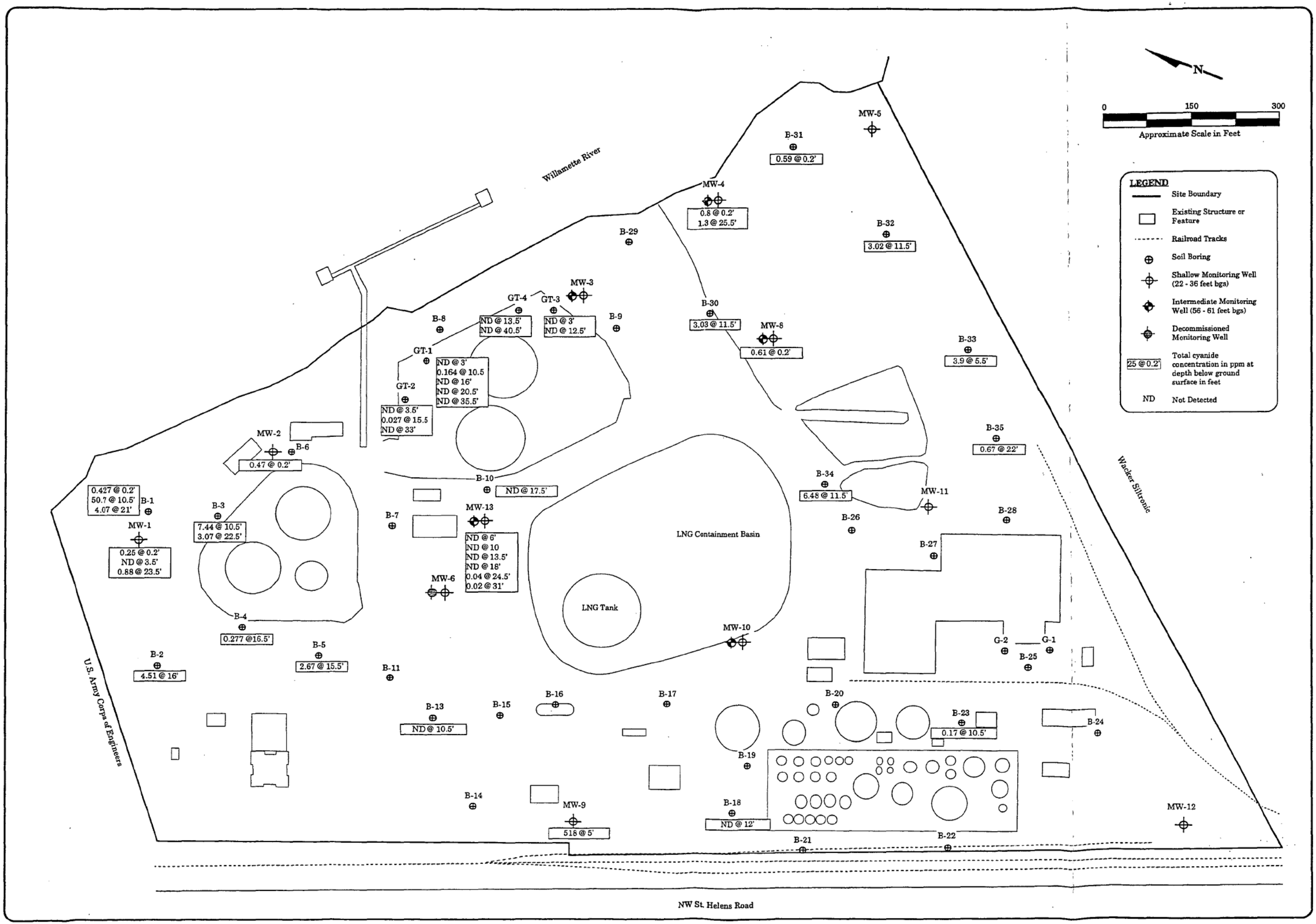

Figure G-4

Soil Sampling Results Map: Total Cyanide

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project #2708

TABLE G-1 – Summary of Analytical Results for Soil Samples
TPH, BTEX, Total PAHs, Total Phenols, Cyanide, and Lead
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number[1]	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results mg/kg (ppm)											
									ODEQ Method		EPA Method 8270 SIM		EPA Method 8020					EPA Method 8270	EPA Method 9010	EPA Method 6010
									TPH-G	TPH-418.1M										
					Sheen	Oil Tar	Tar	Lamp Black	Gasoline	Diesel/Oil	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	Total Phenols	Total Cyanide	Total Lead
B-01	950921-B1-01	2708-S009	21-Sep-95	0.2					ND>10	130.	7.17	13.358	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND		0.427	60.
	950921-B1-02	2708-S009	21-Sep-95	0.2 (dup)						220.	26.14	55.96							0.382	58.
	950921-B1-05	2708-S009	21-Sep-95	10.5	X			X		**640.**	336.7	1,279.7							50.7	130.
	950921-B1-06	2708-S009	21-Sep-95	12.0						**560.**										
	950921-B1-09	2708-S009	21-Sep-95	21.0							0.926	5.026							4.07	
B-02	950927-B2-05	2708-S016	27-Sep-95	16.0				X											4.51	15.
	950927-B2-07	2708-S016	27-Sep-95	20.5																
B-03	950921-B3-05	2708-S007	21-Sep-95	10.5				X		120.	23.04	49.04	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND	7.44	22.
	950921-B3-07	2708-S007	21-Sep-95	15.0						5.9	ND	ND								
	950921-B3-10	2708-S007	21-Sep-95	22.5															3.07	
B-04	950921-B4-05	2708-S008	21-Sep-95	16.5															0.277	
B-05	950928-B5-05	2708-S021	28-Sep-95	15.5						**780.**	0.94	3.64							2.67	
B-06	950927-B6-02	2708-S016	27-Sep-95	8.0	X		X			**810.**	4,413.	12,486.8								
	950927-B6-03	2708-S016	27-Sep-95	15.5						54.	40.2	86.45								
B-07	950927-B7-05	2708-S017	27-Sep-95	17.0							ND	ND								
B-08	950918-B8-04	2708-S001	18-Sep-95	10.0				X		54.	185.	338.49								
	950918-B8-05	2708-S001	18-Sep-95	12.5						15.										
	950918-B8-06	2708-S001	18-Sep-95	12.5 (dup)						18.										
	950918-B8-08	2708-S001	18-Sep-95	18.0							ND	0.243								
B-09	950918-B9-02	2708-S002	18-Sep-95	10.0	X		X		**1,200.**	25.	2,421.5	19,437.5	**104.**	44.2	78.2	102.6	329.			
	950918-B9-08	2708-S002	18-Sep-95	28.0	X				**270.**	**1,600.**										
	950918-B9-09	2708-S002	18-Sep-95	30.5	X						9.48	43.54								
	950918-B9-10	2708-S002	18-Sep-95	34.0							ND	0.464								
B-10	950925-B10-04	2708-S013	25-Sep-95	17.5							ND	ND	ND>0.3	ND>0.3	ND>0.3	ND>0.3		ND	ND>0.5	2.
B-11	950928-B11-01	2708-S019	28-Sep-95	0.2						**1,600.**										
	950928-B11-06	2708-S020	28-Sep-95	12.5	X					**1,700.**	3.26	972.87	ND>0.3	ND>0.3	3.4	3.	6.4			
	950928-B11-09	2708-S020	28-Sep-95	23.0							ND	1.051								
B-13	951006-B13-03	2708-S035	6-Oct-95	10.5	X	X			**1,000.**	**2,700.**	3,915.9	29,386.9	**28.**	ND>20	**110.**	22.	160.	ND	ND>0.1	1.9
	951006-B13-07	2708-S035	6-Oct-95	18.5							ND	ND								
	951006-B13-10	2708-S036	6-Oct-95	24.0					ND>10	ND>5	ND	ND								
B-14	950928-B14-01	2708-S019	28-Sep-95	0.2																
	950928-B14-02	2708-S019	28-Sep-95	2.5	X					280.										
	950928-B14-03	2708-S019	28-Sep-95	5.0							ND	ND								
B-15	951006-B15-05	2708-S036	6-Oct-95	21.0	X				70.	200.	45.9	637.6	**7.9**	ND>0.3	3.9	2.5	14.3			
	951006-B15-08	2708-S036	6-Oct-95	27.0							0.21	1.791								
ODEQ Soil Cleanup Levels [2]					#	#	#	#	80 [4]	500 [4]	see Table G-2	see Table G-2	2.0	80	100	800	#	see Table G-3	40,000 [5]	2,000 [5]
EPA PRGs for Industrial Soil [3]					#	#	#	#	#	#	see Table G-2	see Table G-2	1.37	880	230	320	#	see Table G-3	13,626	1,000

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BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
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TABLE G-1 – Summary of Analytical Results for Soil Samples
TPH, BTEX, Total PAHs, Total Phenols, Cyanide, and Lead
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number[1]	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results mg/kg (ppm)											
									ODEQ Method		EPA Method 8270 SIM		EPA Method 8020					EPA Method 8270	EPA Method 9010	EPA Method 6010
									TPH-G	TPH-418.1M										
					Sheen	Oil Tar	Tar	Lamp Black	Gasoline	Diesel/Oil	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	Total Phenols	Total Cyanide	Total Lead
B-17	950929-B17-01	2708-S022	29-Sep-95	3.0							24.07	59.079								
	950929-B17-05	2708-S022	29-Sep-95	16.5	X	X			**2,400.**	**4,700.**	114.1	1,814.						ND		
	950929-B17-07	2708-S022	29-Sep-95	23.5							ND	0.888								
B-18	950919-B18-05	2708-S003	19-Sep-95	12.0	X				**3,100.**	99.	0.659	59.306	**360.**	**280.**	31.	220.	891.	0.36	ND>0.25	13.
	950919-B18-08	2708-S003	19-Sep-95	19.5	X				**850.**	44.										
	950919-B18-09	2708-S003	19-Sep-95	22.0					24.	380.										
	950919-B18-10	2708-S003	19-Sep-95	24.5							ND	ND								
B-19	950919-B19-01	2708-S003	19-Sep-95	0.2						68.	324.2	933.22	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND		57.
	950919-B19-03	2708-S004	19-Sep-95	6.5	X	X			**1,600.**	**1,500.**	35.76	408.26	**41.**	**120.**	39.	160.	360.	ND		1.6
	950919-B19-04	2708-S004	19-Sep-95	10.5	X				**3,200.**	**1,500.**										11.
	950919-B19-05	2708-S004	19-Sep-95	12.0					**1,900.**	**6,800.**										
	950920-B19-07	2708-S005	20-Sep-95	18.0					**130.**	**760.**	0.101	80.001								
	950920-B19-08	2708-S005	20-Sep-95	27.0							0.027	1.956								
B-20	950929-B20-03	2708-S022	29-Sep-95	10.5	X	X			**940.**	340.	244.507	1,092.607	**120.**	64.	16.	60.	260.	ND		4.5
	950929-B20-07	2708-S023	29-Sep-95	23.5					**220.**	11.	0.255	12.686								
B-21	951003-B21-04	2708-S027	3-Oct-95	11.5							0.418	7.107								9.8
B-22	951003-B22-01	2708-S027	3-Oct-95	3.5	X	X				**530.**										
	951003-B22-05	2708-S027	3-Oct-95	13.5	X						1.727	40.268	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND		5.9
	951003-B22-09	2708-S028	3-Oct-95	24.0	X	X				**600.**	30.23	485.234	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND		2.5
	951003-B22-10	2708-S028	3-Oct-95	26.5						12.										
B-23	951003-B23-02	2708-S028	3-Oct-95	10.5	X				**1,300.**	**930.**									0.17	
	951003-B23-05	2708-S029	3-Oct-95	18.5	X					16.										
	951003-B23-08	2708-S029	3-Oct-95	26.5	X			X		110.	1.117	76.897	**13.**	ND>0.3	ND>0.3	1.3	14.3	ND		5.2
	951003-B23-10	2708-S029	3-Oct-95	31.5	X															
	951003-B23-12	2708-S029	3-Oct-95	34.5							ND	ND	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND			
B-24	951002-B24-03	2708-S024	2-Oct-95	10.5	X		X		**1,500.**	**640.**	276.5	1,091.8								
	951002-B24-10	2708-S024	2-Oct-95	29.0							ND	0.14	**6.8**	2.3	ND>0.3	0.34	9.44			
B-25	951002-B25-03	2708-S025	2-Oct-95	12.5	X				**120.**	35.	3.328	12.458								
	951002-B25-05	2708-S025	2-Oct-95	20.0							ND	0.45								
B-26	951003-B26-01	2708-S030	4-Oct-95	0.2							5.13	9.319								
	951003-B26-06	2708-S030	4-Oct-95	20.5	X	X			**1,300.**	**1,600.**	861.7	15,529.7	**160.**	**110.**	16.	90.	376.	ND		10.
	951003-B26-13	2708-S030	4-Oct-95	39.5					ND>10	ND>5	ND	1.12								
B-27	950920-B27-06	2708-S005	20-Sep-95	13.0	X					8.5										1.9
	950920-B27-08	2708-S005	20-Sep-95	18.0																
	950920-B27-10	2708-S005	20-Sep-95	23.0	X	X			**700.**	**570.**	90.5	1,243.4	**110.**	46.	ND>30	ND>30	156.	ND		5.2
	950920-B27-12	2708-S006	20-Sep-95	28.0					**94.**	ND>5	9.605	125.405	**22.**	3.6	ND>0.6	1.2	26.8			
	950920-B27-15	2708-S006	20-Sep-95	35.5							1.211	12.241								
ODEQ Soil Cleanup Levels [2]					#	#	#	#	80 [4]	500 [4]	see Table G-2	see Table G-2	2.0	80	100	800	#	see Table G-3	40,000 [5]	2,000 [5]
EPA PRGs for Industrial Soil [3]					#	#	#	#	#	#	see Table G-2	see Table G-2	1.37	880	230	320	#	see Table G-3	13,626	1,000

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EPA = U.S. Environmental Protection Agency
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TPH, BTEX, Total PAHs, Total Phenols, Cyanide, and Lead
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number[1]	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results mg/kg (ppm)											
									ODEQ Method		EPA Method 8270 SIM		EPA Method 8020					EPA Method 8270	EPA Method 9010	EPA Method 6010
									TPH-G	TPH-418.1M										
					Sheen	Oil Tar	Tar	Lamp Black	Gasoline	Diesel/Oil	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	Total Phenols	Total Cyanide	Total Lead
B-28	951002-B28-01	2708-S025	2-Oct-95	0.2					ND>10	35.	45.5	86.836	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND		21.
	951002-B28-02	2708-S025	2-Oct-95	0.2 (dup)							65.5	135.19								
	951002-B28-07	2708-S025	2-Oct-95	15.0	X	X			24.	200.	167.2	611.5	**5.5**	ND>2	ND>2	2.3	7.8	ND		5.6
	951002-B28-11	2708-S026	2-Oct-95	24.0					ND>10	ND>5	ND	2.298	0.99	ND>0.3	ND>0.3	ND>0.3	0.99			
B-29	950922-B29-01	2708-S011	22-Sep-95	0.2						190.	138.8	230.07								
	950922-B29-08	2708-S011	22-Sep-95	18.0			X													
	950922-B29-10	2708-S011	22-Sep-95	23.5					ND>10	9.3										
	950922-B29-12	2708-S012	22-Sep-95	28.0	X	X			53.	220.										
	950922-B29-15	2708-S012	22-Sep-95	35.5	X	X			**1,800.**	**4,800.**	5,214.1	58,821.7	**150.**	**140.**	35.	110.	435.	ND		1.7
	950925-B29-17	2708-S013	25-Sep-95	44.0					ND>10	44.	2.614	16.454								
	950925-B29-18	2708-S013	25-Sep-95	47.0							ND	0.18								
B-30A	950922-B30-01	2708-S010	22-Sep-95	0.2						390.	500.	964.5								
B-30	950922-B30-06	2708-S010	22-Sep-95	11.5	X			X	**320.**	**3,200.**	938.7	6,775.7	**18.**	1.9	12.	20.	51.9	ND	3.03	25.
	950922-B30-08	2708-S010	22-Sep-95	17.0																
	950922-B30-12	2708-S010	22-Sep-95	28.5	X				**150.**	120.	94.3	853.	**17.**	ND>3	2.8	ND>3	19.8			
	950922-B30-13	2708-S011	22-Sep-95	33.5					12.	ND>5										
B-31	950925-B31-01	2708-S013	25-Sep-95	0.2					-	240.	22.98	38.148	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND		0.59	14.
	950925-B31-06	2708-S014	25-Sep-95	21.0	X		X	X	**250.**	**2,200.**	1,846.1	12,665.7	ND>3	ND>3	9.1	9.6	18.7	ND		12.
	950925-B31-08	2708-S014	25-Sep-95	24.5					ND>10	34.	2.089	5.494								
	950925-B31-10	2708-S014	25-Sep-95	28.0							ND	ND								
	950925-B31-11	2708-S014	25-Sep-95	28.0 (dup)							ND	ND								
B-32	951003-B32-01	2708-S031	4-Oct-95	0.2						66.	34.8	61.21								
	951003-B32-03	2708-S031	4-Oct-95	11.5				X	**760.**	**6,600.**	3,156.3	28,772.3							3.02	
	951003-B32-15	2708-S032	4-Oct-95	46.5	X	X			**1,400.**	**4,100.**	1,728.	21,961.								
	951003-B32-18	2708-S032	4-Oct-95	58.5	X						ND	1.202	0.95	ND>.3	ND>.3	ND>.3	1.			
B-33	951005-B33-01	2708-S033	5-Oct-95	0.2						170.	575.3	955.4								
	951005-B33-02	2708-S033	5-Oct-95	3.0						140.	151.77	37.51								
	951005-B33-03	2708-S034	5-Oct-95	5.5	X		X		**430.**	**2,700.**	1,054.4	8,238.4	**47.**	22.	29.	28.	126.	ND	3.9	20.
	951005-B33-11	2708-S034	5-Oct-95	38.5	X		X		**1,700.**	**7,600.**										
	951005-B33-14	2708-S034	5-Oct-95	54.0	X		X		36.	230.	3.02	65.04	0.72	0.82	1.	1.1	3.64	ND		2.1
	951006-B33-18	2708-S035	6-Oct-95	69.0							0.525	5.682								
B-34	950926-B34-01	2708-S015	26-Sep-95	0.2						41.	49.2	94.09								
	950926-B34-05	2708-S015	26-Sep-95	11.5	X		X		**3,400.**	**4,200.**	1,639.	13,499.							6.48	
	950926-B34-12	2708-S015	26-Sep-95	36.5	X	X			**1,900.**	69.										
B-35	951005-B35-01	2708-S033	5-Oct-95	0.2						27.	19.49	38.94	ND>0.3	ND>0.3	ND>0.3	ND>0.3	ND	ND		
	951005-B35-06	2708-S033	5-Oct-95	22.0	X	X			**2,200.**	**7,700.**	4,013.5	41,601.5							0.67	
	951005-B35-10	2708-S033	5-Oct-95	29.0							0.784	9.294								
ODEQ Soil Cleanup Levels [2]					#	#	#	#	80 [4]	500 [4]	see Table G-2	see Table G-2	2.0	80	100	800	#	see Table G-3	40,000 [5]	2,000 [5]
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Project No. 2708

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									TPH-G	TPH-418.1M										
					Sheen	Oil Tar	Tar	Lamp Black	Gasoline	Diesel/Oil	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	Total Phenols	Total Cyanide	Total Lead
M-11	951102-M11-01	2708-S047	2-Nov-95	0.2						14.	67.4	105.83								9.9
	951102-M11-09	2708-S047	2-Nov-95	39.0	X						9.723	7.876								
	951102-M11-10	2708-S047	2-Nov-95	43.5							0.966	10.915								
MW-01-22	951024-M1-01	2708-S039	24-Oct-95	0.2							3.07	5.78							0.25	
	951024-M1-02	2708-S039	24-Oct-95	3.5						460.	8.35	12.84							ND>.5	
	951024-M1-06	2708-S039	24-Oct-95	23.5						ND>5	ND	0.461							0.88	
MW-02-32	951106-M2-01	2708-S049	6-Nov-95	0.2							5.2	10.293							0.47	4.9
	951106-M2-06	2708-S049	6-Nov-95	24.0						ND>5	0.152	0.432								
MW-03-56	951101-M3-10	2708-S045	1-Nov-95	31.0	X						3.718	10.128								
	951101-M3-13	2708-S046	1-Nov-95	38.0							ND	ND								
	951101-M3-17	2708-S046	1-Nov-95	53.5							ND	ND								
	951101-M3-18	2708-S046	1-Nov-95	53.5 (dup)							0.044	0.157								
MW-04-57	951030-M4-01	2708-S043	30-Oct-95	0.2						57.	114.	195.1						ND	0.8	29.
	951030-M4-06	2708-S043	30-Oct-95	25.5	X						872.	3,261.	ND>.3	ND>.3	ND>.3	ND>.3	ND	ND	1.3	15.
	951030-M4-15	2708-S044	30-Oct-95	57.0							ND	0.263								
MW-05-32	951027-M5-01	2708-S042	27-Oct-95	0.2							0.817	1.43								
	951027-M5-05	2708-S042	27-Oct-95	15.5					ND>10	350.	810.	1,942.1								
	951027-M5-07	2708-S042	27-Oct-95	21.5							0.242	0.908								
	951027-M5-10	2708-S042	27-Oct-95	31.5							ND	ND								
MW-06-61	951107-M6-01	2708-S050	7-Nov-95	2.5							ND	ND								
	951107-M6-08	2708-S050	7-Nov-95	30.0	X	X					1,389.	20,614.	**67.**	ND>30	**140.**	56.	263.			
	951107-M6-10	2708-S050	7-Nov-95	38.5							0.108	1.819	ND>.3	ND>.3	ND>.3	ND>.3	ND			
	951107-M6-11	2708-S050	7-Nov-95	43.0							ND	0.056								
MW-08-56	951025-M8-01	2708-S040	25-Oct-95	0.2							203.4	280.8							0.61	
	951025-M8-11	2708-S040	25-Oct-95	44.0	X						0.783	8.063								
	951025-M8-15	2708-S041	25-Oct-95	55.0							ND	0.642								
MW-09-29	951023-M9-01	2708-S037	23-Oct-95	0.2							11.7	21.502								
	951023-M9-04	2708-S037	23-Oct-95	5.0						19.	78.5	163.02	ND>.3	ND>.3	ND>.3	ND>.3	ND		518.	
	951023-M9-05	2708-S037	23-Oct-95	11.5							0.163	0.521								
MW-10-61	951108-M10-01	2708-S052	8-Nov-95	0.2							45.	78.741						ND		6.4
	951108-M10-02	2708-S052	8-Nov-95	0.2 (dup)							64.1	106.99								
	951108-M10-09	2708-S052	8-Nov-95	28.0							ND	0.764	**43.**	3.	0.73	ND>.3	46.73			
MW-12-36	951023-M12-01	2708-S037	23-Oct-95	0.2						29.	65.5	116.21								
	951023-M12-06	2708-S038	23-Oct-95	22.0	X	X			**160.**	30.	0.27	8.6	ND>3	8.2	3.5	21.	32.7	ND		2.9
	951023-M12-07	2708-S038	23-Oct-95	26.5							ND	ND								
ODEQ Soil Cleanup Levels [2]					#	#	#	#	80 [4]	500 [4]	see Table G-2	see Table G-2	2.0	80	100	800	#	see Table G-3	40,000 [5]	2,000 [5]
EPA PRGs for Industrial Soil [3]					#	#	#	#	#	#	see Table G-2	see Table G-2	1.37	880	230	320	#	see Table G-3	13,626	1,000

NOTE:
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045), unless otherwise noted
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
4 = Reference Levels are ODEQ UST Level 2 Soil Cleanup Standards (OAR 340-122-335)
5 = Reference Levels are Industrial Maximum Allowable Soil Concentrations in the Soil Cleanup Table (OAR 340-122-045)

# = not established
BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated

ODEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
TPH = total petroleum hydrocarbons
BOLD = Detected above Reference Level

TABLE G-1 – Summary of Analytical Results for Soil Samples
TPH, BTEX, Total PAHs, Total Phenols, Cyanide, and Lead
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number[1]	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results mg/kg (ppm)											
									ODEQ Method		EPA Method 8270 SIM		EPA Method 8020					EPA Method 8270	EPA Method 9010	EPA Method 6010
									TPH-G	TPH-418.1M										
					Sheen	Oil Tar	Tar	Lamp Black	Gasoline	Diesel/Oil	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	Total Phenols	Total Cyanide	Total Lead
MW-13-61	971218-M13-02	2708-S058	18-Dec-97	6.0							ND	ND	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		ND>0.02	
	971218-M13-03	2708-S058	18-Dec-97	10.0							ND	ND	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		ND>0.02	
	971218-M13-04	2708-S058	18-Dec-97	13.5							ND	ND	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		ND>0.02	
	971218-M13-05	2708-S058	18-Dec-97	18.0							0.342	1.	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		ND>0.02	
	971218-M13-08	2708-S058	18-Dec-97	24.5							ND	ND	0.069	ND>0.025	ND>0.025	ND>0.075	0.069		0.04	
	971218-M13-10	2708-S058	18-Dec-97	28.0							ND	0.058								
	971218-M13-11	2708-S058	18-Dec-97	31.0							ND	ND	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		0.02	
	971218-M13-17	2708-S059	18-Dec-97	57.0							ND	ND	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND			
GT-1	971117-001	2708-S054	17-Nov-97	3.0							2.24	4.34	ND>0.025	ND>0.025	ND>0.025	ND>0.075	ND		ND>0.02	
	971117-004	2708-S054	17-Nov-97	10.5	X	X			**300 [6]**	**13,400 [6]**	ND	6.17	ND>0.025	ND>0.025	0.034	0.13	0.164		ND>0.03	
	971117-006	2708-S054	17-Nov-97	16.0							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971117-008	2708-S054	17-Nov-97	20.5							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971117-011	2708-S054	17-Nov-97	35.5							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
GT-2	971117-012	2708-S054	17-Nov-97	3.5							ND	0.084	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971117-017	2708-S055	17-Nov-97	15.5							ND	ND	0.027	ND>0.025	ND>0.075	ND>0.075	0.027		ND>0.02	
	971117-021	2708-S055	17-Nov-97	33.0							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
GT-3	971118-023	2708-S056	18-Nov-97	3.0							21.9	43.09	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971118-026	2708-S056	18-Nov-97	12.5							ND	0.05	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971118-032	2708-S056	18-Nov-97	36.0							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
GT-4	971118-034	2708-S056	18-Nov-97	13.5							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
	971118-038	2708-S057	18-Nov-97	40.5							ND	ND	ND>0.025	ND>0.025	ND>0.075	ND>0.075	ND		ND>0.02	
ODEQ Soil Cleanup Levels [2]					#	#	#	#	80 [4]	500 [4]	see Table G-2	see Table G-2	2.0	80	100	800	#	see Table G-3	40,000 [5]	2,000 [5]
EPA PRGs for Industrial Soil [3]					#	#	#	#	#	#	see Table G-2	see Table G-2	1.37	880	230	320	#	see Table G-3	13,626	1,000

NOTE:
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045), unless otherwise noted
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
4 = Reference Levels are ODEQ UST Level 2 Soil Cleanup Standards (OAR 340-122-335)
5 = Reference Levels are Industrial Maximum Allowable Soil Concentrations in the Soil Cleanup Table (OAR 340-122-045)
6 = Analyzed via Northwest Methods NW-TPH-G and NW-TPH-Dx

# = not established
BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = not detected above detection limit indicated

ODEQ = Oregon Department of Environmental Quality
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
TPH = total petroleum hydrocarbons
BOLD = Detected above Reference Level

Table G-2 – Summary of Analytical Results for Soil Samples, PAHs by EPA Method 8270 (SIM)
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

PAHs by EPA Method 8270 (SIM)					Analytical Results mg/kg (ppm)																
					Carcinogenic PAHs							Non-carcinogenic PAHs									
Soil Boring	Sample Number	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total Carcinogenic PAHs	Total PAHs
B-01	950921-B1-01	2708-S009	21-Sep-95	0.2	**1.**	**1.6**	**0.52**	**1.5**	**1.4**	**0.22**	**0.93**	0.14	ND [a]	0.14	1.3	1.3	0.055	0.073	0.88	2.3	7.17	6.188
	950921-B1-02	2708-S009	21-Sep-95	0.2	**3.7**	**5.6**	**1.7**	**5.2**	**5.6**	**0.84**	**3.5**	0.51	0.41	1.1	5.1	5.7	0.34	0.46	5.8	10.4	26.14	29.82
	950921-B1-05	2708-S009	21-Sep-95	10.5	**45.3**	**72.3**	**26.7**	**55.7**	**82.8**	**7.7**	**46.2**	6.1	5.8	**21.7**	65.8	140.	9.6	**313.**	142.	**239.**	336.7	943.
	950921-B1-09	2708-S009	21-Sep-95	21.0	**0.19**	**0.21**	0.056	**0.17**	**0.19**	ND [a]	**0.11**	0.13	ND [a]	0.24	0.17	0.36	0.14	0.21	2.2	0.65	0.926	4.1
B-03	950921-B3-05	2708-S007	21-Sep-95	10.5	**3.2**	**5.2**	**1.9**	**4.8**	**4.1**	**0.64**	**3.2**	0.3	0.14	3.1	4.2	5.9	0.2	0.16	3.1	8.9	23.04	26.
	950921-B3-07	2708-S007	21-Sep-95	15.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-05	950928-B5-05	2708-S021	28-Sep-95	15.5	ND [b]	**0.2**	ND [b]	**0.18**	ND [b]	ND [b]	**0.56**	0.14	0.44	0.19	1.1	0.34	ND [b]	ND [b]	ND [b]	0.49	0.94	2.7
B-06	950927-B6-02	2708-S016	27-Sep-95	8.0	**574.**	**972.**	**370.**	**767.**	**833.**	**159.**	**738.**	21.	124.	**191.**	1,080.	1,680.	73.8	**884.**	1,180.	**2,840.**	4,413.	8,073.8
	950927-B6-03	2708-S016	27-Sep-95	15.5	**5.7**	**8.8**	**3.5**	**7.1**	**7.6**	**1.1**	**6.4**	ND>1.0	0.55	2.1	9.6	10.2	ND>1.0	ND>1.0	5.5	18.3	40.2	46.25
B-07	950927-B7-05	2708-S017	27-Sep-95	17.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-08	950918-B8-04	2708-S001	18-Sep-95	10.0	**18.**	**40.**	**12.**	**47.**	**24.**	**6.**	**38.**	0.48	4.	2.8	58.	26.	0.71	2.3	7.2	52.	185.	153.49
	950918-B8-08	2708-S001	18-Sep-95	18.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.18	ND [a]	ND [a]	ND [a]	ND [a]	0.063	ND [a]	ND [a]	ND [a]	ND	0.243
B-09	950918-B9-02	2708-S002	18-Sep-95	10.0	**472.**	**420.**	**139.**	**487.**	**601.**	**56.5**	**246.**	**558.**	457.	**603.**	344.	1,350.	**464.**	**7,560.**	3,410.	**2,270.**	2,421.5	17,016.
	950918-B9-09	2708-S002	18-Sep-95	30.5	**1.6**	**1.8**	**0.66**	**2.1**	**1.9**	**0.22**	**1.2**	1.9	0.17	1.3	1.8	4.4	0.99	8.3	7.8	7.4	9.48	34.06
	950918-B9-10	2708-S002	18-Sep-95	34.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.054	ND [a]	0.08	ND [a]	ND [a]	0.2	0.13	ND	0.464
B-10	950925-B10-04	2708-S013	25-Sep-95	17.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-11	950928-B11-06	2708-S020	28-Sep-95	12.5	**0.83**	**0.5**	ND [a]	**0.53**	**1.4**	ND [a]	ND [a]	7.8	0.61	2.7	ND [a]	4.2	6.7	**915.**	25.2	7.4	3.26	969.61
	950928-B11-09	2708-S020	28-Sep-95	23.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.071	ND [a]	0.094	ND [a]	0.17	0.076	ND [a]	0.35	0.29	ND	1.051
B-13	951006-B13-03	2708-S035	6-Oct-95	10.5	**564.**	**752.**	**238.**	**942.**	**811.**	**89.9**	**519.**	**1,630.**	155.	**578.**	747.	2,350.	**481.**	**13,000.**	2,950.	**3,580.**	3,915.9	25,471.
	951006-B13-07	2708-S035	6-Oct-95	18.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	951006-B13-10	2708-S036	6-Oct-95	24.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-14	950928-B14-03	2708-S019	28-Sep-95	5.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-15	951006-B15-05	2708-S036	6-Oct-95	21.0	**6.8**	**9.7**	**3.2**	**9.3**	**9.7**	1.	**6.2**	16.1	4.1	**6.6**	9.	27.7	6.9	**400.**	80.	41.3	45.9	591.7
	951006-B15-08	2708-S036	6-Oct-95	27.0	ND [a]	0.05	0.16	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.053	0.13	ND [a]	0.24	0.038	0.13	0.59	0.4	0.21	1.581
B-17	950929-B17-01	2708-S022	29-Sep-95	3.0	**3.5**	**5.6**	**1.3**	**5.7**	**3.6**	0.67	**3.7**	0.026	0.22	0.92	5.3	10.5	0.15	0.093	4.	13.8	24.07	35.009
	950929-B17-05	2708-S022	29-Sep-95	16.5	**28.**	**15.**	**5.8**	**16.**	**44.**	**1.1**	**4.2**	**161.**	10.	**111.**	5.9	114.	**119.**	**478.**	477.	**224.**	114.1	1,699.9
	950929-B17-07	2708-S022	29-Sep-95	23.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.078	ND [a]	0.086	ND [a]	0.072	0.062	0.16	0.32	0.11	ND	0.888
B-18	950919-B18-05	2708-S003	19-Sep-95	12.0	**0.17**	0.09	0.032	0.074	**0.26**	ND [a]	0.033	1.9	0.16	0.44	0.047	1.1	1.8	**44.8**	6.7	1.7	0.659	58.647
	950919-B18-10	2708-S003	19-Sep-95	24.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
B-19	950919-B19-01	2708-S003	19-Sep-95	0.2	**53.1**	**57.6**	**29.6**	**61.**	**71.4**	**10.**	**41.5**	6.8	0.52	**212.**	46.	115.	20.1	2.9	91.7	**114.**	324.2	609.02
	950919-B19-03	2708-S004	19-Sep-95	6.5	**7.6**	**5.4**	**2.4**	**5.8**	**9.7**	**0.96**	**3.9**	13.4	4.6	**14.4**	5.1	25.4	13.	**180.**	83.3	33.3	35.76	372.5
	950920-B19-07	2708-S005	20-Sep-95	18.0	0.054	ND [a]	0.047	ND [a]	ND [a]	ND [a]	ND [a]	0.5	0.17	ND [a]	ND [a]	0.18	0.77	**76.3**	1.7	0.28	0.101	79.9
	950929-B19-08	2708-S005	20-Sep-95	27.0	0.027	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.081	ND [a]	0.081	ND [a]	0.13	0.097	1.1	0.3	0.14	0.027	1.929
B-20	950929-B20-03	2708-S022	29-Sep-95	10.5	**40.4**	**44.5**	**19.**	**45.**	**67.1**	**4.707**	**23.8**	35.8	9.4	**122.**	29.3	113.	57.8	27.8	239.	**214.**	244.507	848.1
	950929-B20-07	2708-S023	29-Sep-95	23.5	0.048	0.06	ND [a]	0.053	0.054	ND [a]	0.04	0.068	0.095	0.063	0.055	0.18	0.11	11.2	0.36	0.3	0.255	12.431
B-21	951003-B21-04	2708-S027	3-Oct-95	11.5	**0.12**	0.079	0.079	ND [a]	**0.14**	ND [a]	ND [a]	1.3	0.44	0.2	ND [a]	0.59	0.089	0.71	2.5	0.86	0.418	6.689
ODEQ Soil Cleanup Levels [2]					0.1	0.1	0.1	0.1	0.1	0.1	0.1	2,000.	#	20,000.	#	8,000.	2,000.	30.	#	6,000.	#	#
EPA PRGs for Industrial Soil [3]					2.61	2.61	26.13	0.26	7.2	0.26	2.61	110.	#	5.7	#	27,251.	90.	240.	#	100.	#	#

Note:
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million

# = Reference level not established
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045)
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
Bold = Detected above Reference Levels

a = detection limit is 0.05 mg/kg (ppm)
b = detection limit is 0.2 mg/kg (ppm)
c = detection limit is 1 mg/kg (ppm)
d = detection limit is 100 mg/kg (ppm)
e = detection limit is 0.5 mg/kg (ppm)
f = detection limit is 0.7 mg/kg (ppm)

Updated: 9/22/98 RBE
File Name: 2708-G1 Soil Quality Table

SCOEPA00011144

Table G-2 - Summary of Analytical Results for Soil Samples, PAHs by EPA Method 8270 (SIM)
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

PAHs by EPA Method 8270 (SIM)					Analytical Results mg/kg (ppm)																	
					Carcinogenic PAHs							Non-carcinogenic PAHs										
Soil Boring	Sample Number	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total Carcinogenic PAHs	Total PAHs
B-22	951003-B22-05	2708-S027	3-Oct-95	13.5	**0.63**	**0.19**	**0.12**	**0.15**	**0.58**	ND a	0.057	9.4	0.076	1.2	0.055	5.3	5.7	0.31	12.2	4.3	1.727	38.541
	951003-B22-09	2708-S028	3-Oct-95	24.0	**9.2**	**4.**	**1.7**	**2.6**	**12.**	0.15	**0.58**	78.8	0.504	**17.6**	0.49	65.4	59.9	0.41	160.2	71.7	30.23	455.004
B-23	951003-B23-08	2708-S029	3-Oct-95	26.5	**0.2**	**0.19**	0.097	**0.2**	**0.27**	ND a	**0.16**	0.87	1.2	0.52	0.19	1.4	3.	**58.8**	8.2	1.6	1.117	75.78
	951003-B23-12	2708-S029	3-Oct-95	34.5	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND	ND
B-24	951002-B24-03	2708-S024	2-Oct-95	10.5	**41.9**	**53.2**	**21.3**	**59.5**	**64.1**	**5.5**	**31.**	52.4	7.5	**34.9**	42.	132.	28.5	**115.**	186.	**217.**	276.5	815.3
	951002-B24-10	2708-S024	2-Oct-95	29.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.14	ND a	ND a	ND	0.14
B-25	951002-B25-03	2708-S025	2-Oct-95	12.5	**0.41**	**0.71**	**0.25**	**0.78**	**0.6**	0.078	**0.5**	0.41	0.15	0.29	0.75	1.2	0.53	1.2	2.5	2.1	3.328	9.13
	951002-B25-05	2708-S025	2-Oct-95	20.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.45	ND a	ND a	ND	0.45
B-26	951003-B26-01	2708-S030	4-Oct-95	0.2	**0.73**	**1.2**	**0.49**	**0.99**	**0.77**	**0.16**	**0.79**	0.092	ND a	0.097	0.84	1.5	ND a	ND a	0.46	1.2	5.13	4.189
	951003-B26-06	2708-S030	4-Oct-95	20.5	**124.**	**134.**	**57.**	**138.**	**265.**	**20.7**	**123.**	**608.**	449.	**1,220.**	171.	949.	**681.**	**6,420.**	2,630.	**1,540.**	861.7	14,668.
	951003-B26-13	2708-S030	4-Oct-95	39.5	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.059	0.046	0.051	ND a	0.066	0.059	0.55	0.19	0.099	ND	1.12
B-27	950920-B27-10	2708-S005	20-Sep-95	23.0	**17.2**	**16.3**	**6.2**	**18.3**	**21.**	**1.9**	**9.6**	53.	32.6	**21.9**	13.6	79.1	45.7	**586.**	208.	**113.**	90.5	1,152.9
	950920-B27-12	2708-S006	20-Sep-95	28.0	**1.9**	**1.6**	**0.78**	**1.7**	**2.6**	**0.11**	**0.915**	8.6	2.	3.1	1.3	9.9	6.5	**44.7**	26.4	13.3	9.605	115.8
	950920-B27-15	2708-S006	20-Sep-95	35.5	**0.31**	**0.26**	0.091	**0.16**	**0.28**	ND a	**0.11**	1.1	0.14	0.36	0.15	1.3	0.88	1.8	3.5	1.8	1.211	11.03
B-28	951002-B28-01	2708-S025	2-Oct-95	0.2	**6.1**	**10.1**	**4.3**	**8.6**	**8.2**	**1.6**	**6.6**	0.73	0.26	4.6	8.2	9.7	0.246	0.3	4.6	12.7	45.5	41.336
	951002-B28-02	2708-S025	2-Oct-95	0.2	**9.5**	**14.9**	**6.3**	**14.1**	**9.5**	**2.4**	**8.8**	1.1	0.86	1.8	12.3	17.3	0.55	0.88	9.2	25.7	65.5	69.69
	951002-B28-07	2708-S025	2-Oct-95	15.0	**19.1**	**33.4**	**12.6**	**42.7**	**30.2**	**3.6**	**25.6**	23.8	3.7	**11.2**	39.5	66.1	14.	**102.**	74.	**110.**	167.2	444.3
	951002-B28-11	2708-S026	2-Oct-95	24.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.057	ND a	ND a	ND a	ND a	ND a	2.2	0.041	ND a	ND	2.298
B-29	950922-B29-01	2708-S011	22-Sep-95	0.2	**10.5**	**31.7**	**11.6**	**32.5**	**19.3**	**4.8**	**28.4**	0.4	7.3	3.3	41.8	9.4	0.47	2.4	3.4	22.8	138.8	91.27
	950922-B29-15	2708-S012	22-Sep-95	35.5	**1,540.**	**758.**	**308.**	**571.**	**1,810.**	**46.1**	**181.**	**9,210.**	77.6	**1,650.**	230.	8,480.	**4,530.**	**7,400.**	15,500.	**6,530.**	5,214.1	53,607.6
	950925-B29-17	2708-S013	25-Sep-95	44.0	**0.56**	**0.45**	**0.12**	**0.51**	**0.68**	0.054	**0.24**	1.1	0.33	1.	0.3	1.6	0.84	0.77	5.1	2.8	2.614	13.84
	950925-B29-18	2708-S013	25-Sep-95	47.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.18	ND a	ND a	ND	0.18
B-30A	950922-B30-01	2708-S010	22-Sep-95	0.2	**49.8**	**110.**	**45.**	**99.6**	**75.4**	**20.2**	**100.**	9.2	13.4	**16.**	129.	110.5	5.9	9.4	37.3	**133.8**	500.	464.5
B-30	950922-B30-06	2708-S010	22-Sep-95	11.5	**167.**	**167.**	**71.9**	**182.**	**245.**	**16.5**	**89.3**	**220.**	228.	**417.**	125.	739.	**310.**	**1,730.**	1,260.	**808.**	938.7	5,837.
	950922-B30-12	2708-S010	22-Sep-95	28.5	**14.3**	**17.4**	**7.4**	**22.**	**19.8**	**1.8**	**11.6**	15.2	68.8	**28.7**	17.7	53.3	31.	**327.**	126.	91.	94.3	758.7
B-31	950925-B31-01	2708-S013	25-Sep-95	0.2	**2.1**	**5.4**	**1.8**	**4.8**	**3.**	**0.98**	**4.9**	0.11	1.3	0.59	6.8	1.6	0.058	0.3	0.71	3.7	22.98	15.168
	950925-B31-06	2708-S014	25-Sep-95	21.0	**319.**	**321.**	**119.**	**374.**	**394.**	**45.1**	**274.**	**1,120.**	50.6	**473.**	364.	1,290.	**422.**	**2,880.**	2,620.	**1,600.**	1,846.1	10,819.6
	950925-B31-08	2708-S014	25-Sep-95	24.5	**0.28**	**0.35**	**0.11**	**0.7**	**0.39**	0.039	**0.22**	0.072	ND a	0.18	0.27	0.88	0.063	ND>0.05	0.54	1.4	2.089	3.405
	950925-B31-10	2708-S014	25-Sep-95	28.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND	ND
	950925-B31-11	2708-S014	25-Sep-95	28.0	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND a	ND	ND
B-32	951004-B32-01	2708-S031	4-Oct-95	0.2	**2.9**	**6.9**	**2.5**	**7.4**	**5.6**	**1.8**	**7.7**	0.09	1.7	0.53	12.4	2.7	0.11	0.82	0.66	7.4	34.8	26.41
	951004-B32-03	2708-S031	4-Oct-95	11.5	**495.**	**500.**	**292.**	**585.**	**824.**	**87.3**	**373.**	**990.**	807.	**1,190.**	529.	2,050.	**810.**	**11,100.**	4,560.	**3,580.**	3,156.3	25,616.
	951004-B32-15	2708-S032	4-Oct-95	38.5	**259.**	**285.**	**81.**	**386.**	**427.**	**52.**	**238.**	**1,330.**	39.	**1,280.**	354.	1,180.	**520.**	**11,100.**	2,440.	**1,990.**	1,728.	20,233.
	951004-B32-18	2708-S032	4-Oct-95	58.5	ND a	ND a	ND a	ND a	ND a	ND a	ND a	0.064	ND a	0.061	ND a	0.13	0.047	0.38	0.31	0.21	ND	1.202
ODEQ Soil Cleanup Levels [2]					0.1	0.1	0.1	0.1	0.1	0.1	0.1	2,000.	#	20,000.	#	8,000.	2,000.	30.	#	6,000.	#	#
EPA PRGs for Industrial Soil [3]					2.61	2.61	26.13	0.26	7.2	0.26	2.61	110.	#	5.7	#	27,251.	90.	240.	#	100.	#	#

Note:
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million

# = Reference level not established
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045)
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
Bold = Detected above Reference Levels

a = detection limit is 0.05 mg/kg (ppm)
b = detection limit is 0.2 mg/kg (ppm)
c = detection limit is 1 mg/kg (ppm)
d = detection limit is 100 mg/kg (ppm)
e = detection limit is 0.5 mg/kg (ppm)
f = detection limit is 0.7 mg/kg (ppm)

Table G-2 – Summary of Analytical Results for Soil Samples, PAHs by EPA Method 8270 (SIM)
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

PAHs by EPA Method 8270 (SIM)					Analytical Results mg/kg (ppm)																	
					Carcinogenic PAHs							Non-carcinogenic PAHs										
Soil Boring	Sample Number	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total Carcinogenic PAHs	Total PAHs
B-33	951005-B33-01	2708-S033	5-Oct-95	0.2	**34.6**	**124.**	**44.**	**129.**	**70.**	**32.7**	**141.**	1.3	29.1	**9.9**	202.	29.5	1.6	9.1	10.5	87.1	575.3	380.1
	951005-B33-02	2708-S033	5-Oct-95	2.5	**1.9**	**2.4**	**0.88**	**2.8**	**2.5**	**0.29**	**1.5**	1.7	0.23	0.96	2.1	6.4	0.85	1.5	4.1	7.4	12.27	25.24
	951005-B33-03	2708-S034	5-Oct-95	5.5	**181.**	**185.**	**72.1**	**225.**	**262.**	**21.3**	**108.**	**369.**	133.	**263.**	152.	527.	**266.**	**3,460.**	1,190.	**824.**	1,054.4	7,184.
	951005-B33-14	2708-S034	5-Oct-95	54.0	**0.65**	**0.57**	ND [c]	**0.7**	**1.1**	ND [c]	ND [c]	3.4	ND [c]	2.1	0.62	3.4	1.5	**37.**	8.6	5.4	3.02	62.02
	951006-B33-18	2708-S035	6-Oct-95	69.0	0.045	0.054	ND [a]	**0.37**	0.056	ND [a]	ND [a]	0.06	0.35	0.12	0.047	0.18	0.12	3.5	0.47	0.31	0.525	5.157
B-34	950926-B34-01	2708-S015	26-Sep-95	0.2	**6.**	**10.**	**4.5**	**9.9**	**9.6**	**1.6**	**7.6**	0.99	0.46	1.5	9.5	11.7	0.44	1.1	5.6	13.6	49.2	44.89
	950926-B34-05	2708-S015	26-Sep-95	11.5	**227.**	**256.**	**153.**	**356.**	**383.**	**41.**	**223.**	**253.**	452.	**1,289.**	318.	849.	**409.**	**5,420.**	1,580.	**1,290.**	1,639.	11,860.
B-35	951005-B35-01	2708-S033	5-Oct-95	0.2	**2.2**	**4.**	**1.5**	**4.1**	**4.1**	**0.59**	**3.**	0.14	0.54	0.88	4.5	4.	0.15	0.34	2.2	6.7	19.49	19.45
	951005-B35-06	2708-S033	5-Oct-95	22.0	**613.**	**780.**	**269.**	**954.**	**809.**	**91.5**	**497.**	**532.**	1,960.	**880.**	714.	2,600.	**982.**	**20,700.**	4,890.	**4,330.**	4,013.5	37,588.
	951005-B35-10	2708-S033	5-Oct-95	29.0	**0.13**	**0.14**	0.068	**0.17**	**0.18**	ND [a]	0.096	0.52	0.28	0.27	0.14	0.5	0.28	4.3	1.4	0.82	0.784	8.51
M-11	951102-M11-01	2708-S047	2-Nov-95	0.2	**8.1**	**18.**	**6.**	**10.**	**6.9**	**2.3**	**9.2**	0.73	0.91	0.82	12.	12.	0.3	0.37	4.2	14.	67.4	45.33
	951102-M11-09	2708-S047	2-Nov-95	39.0	**0.16**	**0.11**	0.046	0.077	**0.13**	ND [a]	0.047	0.85	0.083	0.21	0.063	0.94	0.65	1.5	2.1	0.91	9.723	7.306
	951102-M11-10	2708-S047	2-Nov-95	43.5	**0.26**	**0.14**	0.07	**0.16**	**0.26**	ND [a]	0.076	0.8	0.089	0.4	0.11	1.4	0.65	2.	3.1	1.4	0.966	9.949
MW-01-22	951024-M1-01	2708-S039	24-Oct-95	0.2	**0.41**	**0.66**	ND [a]	**0.61**	**0.64**	ND [a]	**0.75**	ND [a]	ND [a]	ND [a]	1.	0.71	ND [a]	ND [a]	ND [a]	1.	3.07	2.71
	951024-M1-02	2708-S039	24-Oct-95	3.5	**0.91**	**1.5**	**0.74**	**1.7**	**1.3**	**0.4**	**1.8**	ND [b]	ND [b]	ND [b]	2.3	0.79	ND [b]	ND [b]	ND [b]	1.4	8.35	4.49
	951024-M1-06	2708-S039	24-Oct-95	23.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.19	ND [a]	0.032	ND [a]	ND [a]	0.15	0.089	ND	0.461
MW-02-32	951106-M2-01	2708-S049	6-Nov-95	0.2	0.73	**1.2**	0.49	**1.1**	0.83	0.16	0.69	0.047	0.083	0.14	1.	1.4	ND>0.05	0.053	0.57	1.8	5.2	5.093
	951106-M2-06	2708-S049	6-Nov-95	24.0	0.039	0.036	ND [a]	0.04	0.037	ND [a]	ND [a]	0.2	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.08	ND [a]	ND [a]	0.152	0.28
MW-03-56	951101-M3-10	2708-S045	1-Nov-95	31.0	**0.53**	**0.83**	**0.3**	**0.84**	**0.51**	0.098	**0.61**	0.19	0.14	0.14	0.96	1.4	0.16	0.65	0.77	2.	3.718	6.41
	951101-M3-13	2708-S046	1-Nov-95	38.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	951101-M3-17	2708-S046	1-Nov-95	53.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	951101-M3-18	2708-S046	1-Nov-95	53.5 (dup)	ND [a]	0.044	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.04	0.031	ND [a]	ND [a]	ND [a]	0.042	0.044	0.113
MW-04-57	951030-M4-01	2708-S043	30-Oct-95	0.2	**10.**	**26.**	**10.**	**28.**	**15.**	**4.**	**21.**	ND>5.0	4.4	2.6	35.	12.	ND>5.0	1.7	3.4	22.	114.	81.1
	951030-M4-06	2708-S043	30-Oct-95	25.5	**190.**	**200.**	**68.**	**210.**	**180.**	**24.**	ND [d]	65.	ND [d]	**110.**	190.	640.	49.	**25.**	480.	**830.**	872.	2,389.
	951030-M4-15	2708-S044	30-Oct-95	57.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.03	ND [a]	ND [a]	ND [a]	0.053	ND [a]	0.08	0.033	0.067	ND	0.263
MW-05-32	951027-M5-01	2708-S042	27-Oct-95	0.2	**0.13**	**0.22**	0.077	**0.15**	**0.13**	ND [a]	**0.11**	ND [a]	ND [a]	ND [a]	0.15	0.2	ND [a]	ND [a]	0.073	0.19	0.817	0.613
	951027-M5-05	2708-S042	27-Oct-95	15.5	**115.**	**170.**	**58.**	**208.**	**130.**	**25.**	**104.**	19.	15.	**41.**	153.	330.	16.	**8.1**	113.	**437.**	810.	1,132.1
	951027-M5-07	2708-S042	27-Oct-95	21.5	0.067	0.039	ND [a]	0.051	0.085	ND [a]	ND [a]	ND [a]	ND [a]	0.072	0.044	0.17	ND [a]	ND [a]	0.15	0.23	0.242	0.666
	951027-M5-10	2708-S042	27-Oct-95	31.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
MW-06-61	951107-M6-01	2708-S050	7-Nov-95	2.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	951107-M6-08	2708-S050	7-Nov-95	30.0	**340.**	**170.**	**120.**	**190.**	**450.**	**25.**	**94.**	**2,350.**	25.	**1,420.**	130.	1,900.	**990.**	**3,650.**	5,780.	**2,980.**	1,389.	19,225.
	951107-M6-10	2708-S050	7-Nov-95	38.5	0.042	ND [a]	ND [a]	ND [a]	0.066	ND [a]	ND [a]	0.22	ND [a]	0.16	ND [a]	0.22	0.095	0.076	0.6	0.34	0.108	1.711
	951107-M6-11	2708-S050	7-Nov-95	43.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.056	ND [a]	ND	0.056
ODEQ Soil Cleanup Levels [2]					0.1	0.1	0.1	0.1	0.1	0.1	0.1	2,000.	#	20,000.	#	8,000.	2,000.	30.	#	6,000.	#	#
EPA PRGs for Industrial Soil [3]					2.61	2.61	26.13	0.26	7.2	0.26	2.61	110.	#	5.7	#	27,251.	90.	240.	#	100.	#	#

Note:
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million

# = Reference level not established
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045)
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
Bold = Detected above Reference Levels

a = detection limit is 0.05 mg/kg (ppm)
b = detection limit is 0.2 mg/kg (ppm)
c = detection limit is 1 mg/kg (ppm)
d = detection limit is 100 mg/kg (ppm)
e = detection limit is 0.5 mg/kg (ppm)
f = detection limit is 0.7 mg/kg (ppm)

Updated: 9/22/98 RBE
File Name: 2708-G1 Soil Quality Table

Table G-2 – Summary of Analytical Results for Soil Samples, PAHs by EPA Method 8270 (SIM)
Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

PAHs by EPA Method 8270 (SIM)					Analytical Results mg/kg (ppm)																	
					Carcinogenic PAHs							Non-carcinogenic PAHs										
Soil Boring	Sample Number	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Total Carcinogenic PAHs	Total PAHs
MW-08-56	951025-M8-01	2708-S040	25-Oct-95	0.2	**12.**	**39.6**	**13.8**	**41.7**	**20.5**	**9.1**	**46.2**	ND>0.50	3.2	1.8	56.5	6.7	ND [a]	2.2	1.4	26.1	203.4	97.9
	951025-M8-11	2708-S040	25-Oct-95	44.0	0.17	0.12	0.053	0.15	0.21	ND [a]	0.08	0.74	0.3	0.22	0.13	0.6	0.48	2.6	1.5	0.71	0.783	7.28
	951025-M8-15	2708-S041	25-Oct-95	55.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.057	ND [a]	0.065	ND [a]	0.31	0.11	0.1	ND	0.642
MW-09-29	951023-M9-01	2708-S037	23-Oct-95	0.2	**1.4**	**2.7**	0.88	**2.5**	**1.9**	0.42	**1.9**	0.12	0.17	0.31	2.6	2.2	0.055	0.087	0.96	3.3	11.7	9.802
	951023-M9-04	2708-S037	23-Oct-95	5.0	**7.4**	**19.6**	**5.**	**14.4**	**13.3**	**2.7**	**16.1**	0.12	1.3	2.	22.6	17.9	0.4	1.2	8.6	30.4	78.5	84.52
	951023-M9-05	2708-S037	23-Oct-95	11.5	0.028	0.035	ND [a]	0.032	0.041	ND [a]	0.027	ND [a]	ND [a]	0.03	0.036	0.076	ND [a]	ND [a]	0.096	0.12	0.163	0.358
MW-10-61	951108-M10-01	2708-S052	8-Nov-95	0.2	**6.7**	**11.**	**5.1**	**9.5**	**6.3**	**1.4**	**5.**	0.83	ND [a]	1.7	6.7	11.	0.23	0.081	3.3	9.9	45.	33.741
	951108-M10-02	2708-S052	8-Nov-95	0.2 (dup)	**10.**	**17.**	**6.2**	**14.**	**7.5**	**2.2**	**7.2**	1.1	ND [a]	1.1	9.	14.	0.36	0.13	5.2	12.	64.1	42.89
	951108-M10-09	2708-S052	8-Nov-95	28.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.038	ND [a]	0.038	ND [a]	0.078	ND [a]	0.23	0.22	0.16	ND	0.764
MW-12-36	951023-M12-01	2708-S037	23-Oct-95	0.2	**8.5**	**15.3**	**5.2**	**13.3**	**12.3**	**2.2**	**8.7**	1.5	0.23	2.	10.8	12.4	0.54	0.34	5.8	17.1	65.5	50.71
	951023-M12-06	2708-S038	23-Oct-95	22.0	ND [a]	ND [a]	ND [a]	ND [a]	0.27	ND [a]	ND [a]	0.34	ND [a]	0.99	ND [a]	0.97	0.4	0.23	4.	1.4	0.27	8.33
	951023-M12-07	2708-S038	23-Oct-95	26.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
GT-1	971117-001	2708-S054	17-Nov-97	3.0	0.27	0.5	0.16	0.58	0.25	ND [a]	0.48	ND [a]	ND [a]	ND [a]	1.	0.38	ND [a]	ND [a]	0.06	0.66	2.24	2.1
	971117-004	2708-S054	17-Nov-97	10.5	ND [f]	ND [f]	ND [f]	ND [f]	ND [f]	ND [f]	ND [f]	**1.4**	ND [f]	0.97	ND [f]	ND [f]	2.1	ND [f]	ND [f]	1.7	ND	6.17
	971117-006	2708-S054	17-Nov-97	16.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971117-008	2708-S054	17-Nov-97	20.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971117-011	2708-S054	17-Nov-97	35.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
GT-2	971117-012	2708-S054	17-Nov-97	3.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.084	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	0.084
	971117-017	2708-S055	17-Nov-97	15.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971117-021	2708-S055	17-Nov-97	33.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
GT-3	971118-023	2708-S056	18-Nov-97	3.0	**2.2**	**3.3**	**8.4**	**3.8**	**1.8**	ND [a]	**2.4**	0.33	0.29	0.11	4.1	7.5	ND [a]	0.14	0.12	8.6	21.9	21.19
	971118-026	2708-S056	18-Nov-97	12.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.05	ND [a]	ND [a]	ND [a]	0.049	ND	0.099
	971118-032	2708-S056	18-Nov-97	36.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
GT-4	971118-034	2708-S056	18-Nov-97	13.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971118-038	2708-S057	18-Nov-97	40.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
MW-13	971218-M13-02	2708-S058	18-Dec-97	6.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971218-M13-03	2708-S058	18-Dec-97	10.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971218-M13-04	2708-S058	18-Dec-97	13.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971218-M13-05	2708-S058	18-Dec-97	18.0	0.09	0.071	ND [a]	0.061	0.12	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.16	ND [a]	0.23	0.093	0.17	0.342	0.653
	971218-M13-08	2708-S058	18-Dec-97	24.5	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971218-M13-10	2708-S058	18-Dec-97	28.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	0.058	ND [a]	ND	0.058
	971218-M13-11	2708-S058	18-Dec-97	31.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
	971218-M13-17	2708-S059	18-Dec-97	57.0	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND [a]	ND	ND
ODEQ Soil Cleanup Levels [2]					0.1	0.1	0.1	0.1	0.1	0.1	0.1	2,000.	#	20,000.	#	8,000.	2,000.	30.	#	6,000.	#	#
EPA PRGs for Industrial Soil [3]					2.61	2.61	26.13	0.26	7.2	0.26	2.61	110.	#	5.7	#	27,251.	90.	240.	#	100.	#	#

Note:
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = Not detected above detection limit indicated
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million

# = Reference level not established
1 = Sample number prefix: 2708-
2 = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045)
3 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
Bold = Detected above Reference Levels

a = detection limit is 0.05 mg/kg (ppm)
b = detection limit is 0.2 mg/kg (ppm)
c = detection limit is 1 mg/kg (ppm)
d = detection limit is 100 mg/kg (ppm)
e = detection limit is 0.5 mg/kg (ppm)
f = detection limit is 0.7 mg/kg (ppm)

Updated: 9/22/98 RBE
File Name: 2708-G1 Soil Quality Table

SCOEPA00011147

TABLE G-3 – Summary of Analytical Results for Soil Samples
Phenols by EPA Method 8270

Remedial Investigation
Northwest Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Phenols by EPA Method 8270					Analytical Results mg/kg (ppm)															
Soil Boring	Sample Number	Chain of Custody Number	Sample Date	Sample Depth (feet bgs)	4-Chloro-3-methylphenol	2-Chlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2-Methyl-4,6-dinitrophenol	Cresols, Total	4-Methylphenol	2-Nitrophenol	4-Nitrophenol	2,3,4,6-Tetrachlorophenol	Pentachlorophenol	Phenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	Total Phenols
B-03	950921-B3-05	2708-S007	21-Sep-95	10.5	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>3.3	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND
B-10	950925-B10-04	2708-S013	25-Sep-95	17.5	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>9.9	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND
B-13	951006-B13-03	2708-S035	6-Oct-95	10.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-17	950929-B17-05	2708-S022	29-Sep-95	16.5	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>9.9	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND
B-18	950919-B18-05	2708-S003	19-Sep-95	12.0	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	**0.36**	ND>0.17	ND>0.17	ND>0.17	0.36
B-19	950919-B19-01	2708-S003	19-Sep-95	0.2	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.33	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND
B-19	950919-B19-03	2708-S004	19-Sep-95	6.5	ND>26	ND>26	ND>26	ND>26	ND>50	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND
B-20	950929-B20-03	2708-S022	29-Sep-95	10.5	ND>26	ND>26	ND>26	ND>26	ND>50	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND
B-22	951003-B22-05	2708-S027	3-Oct-95	13.5	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.33	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND
B-22	951003-B22-09	2708-S028	3-Oct-95	24.0	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>.33	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND>0.17	ND
B-23	951003-B23-08	2708-S029	3-Oct-95	26.5	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>2.0	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND>0.8	ND
B-26	951003-B26-06	2708-S030	4-Oct-95	20.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-27	950920-B27-10	2708-S005	20-Sep-95	23.0	ND>26	ND>26	ND>26	ND>26	ND>50	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND>26	ND
B-28	951002-B28-01	2708-S025	2-Oct-95	0.2	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>9.9	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND>5.1	ND
B-28	951002-B28-07	2708-S025	2-Oct-95	15.0	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-29	950922-B29-15	2708-S012	22-Sep-95	35.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-30	950922-B30-06	2708-S010	22-Sep-95	11.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-31	950925-B31-06	2708-S014	25-Sep-95	21.0	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-33	951005-B33-03	2708-S034	5-Oct-95	5.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
B-33	951005-B33-14	2708-S034	5-Oct-95	54.0	ND>17	ND>17	ND>17	ND>17	ND>33	ND>17	ND>17	ND>17	ND>17	ND>17	ND>17	ND>17	ND>17	ND>17	ND>17	ND
B-35	951005-B35-01	2708-S033	5-Oct-95	0.2	ND>.17	ND>.17	ND>.17	ND>.17	ND>.33	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND>.17	ND
MW-04-57	951030-M4-01	2708-S043	30-Oct-95	0.2	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
MW-04-57	951030-M4-06	2708-S043	30-Oct-95	25.5	ND>51	ND>51	ND>51	ND>51	ND>99	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND>51	ND
MW-10-60	951108-M10-01	2708-S052	8-Nov-95	0.2	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>6.6	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND>3.4	ND
MW-12-34	951023-M12-06	2708-S038	23-Oct-95	22.0	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>3.3	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND>1.7	ND
ODEQ Soil Cleanup Levels [2]					#	#	#	#	#	#	#	#	#	#	#	5	#	#	2	#
EPA PRGs for Industrial Soil [3]					#	367	2,044	13,625	1,363	#	34,063	3,406	#	#	20,438	7.95	100,000	68,126	173	#

Note: DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
ND = Not detected above detection limit indicated

[1] = Sample number prefix: 2708-
[2] = Reference Levels are Soil Cleanup Levels in the Soil Cleanup Table (OAR 340-122-045)
[3] = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil
# = Reference level not established

Updated: 9/22/98 RBE
File Name: 2708-G1 Soil Quality Table

SCOEPA00011148

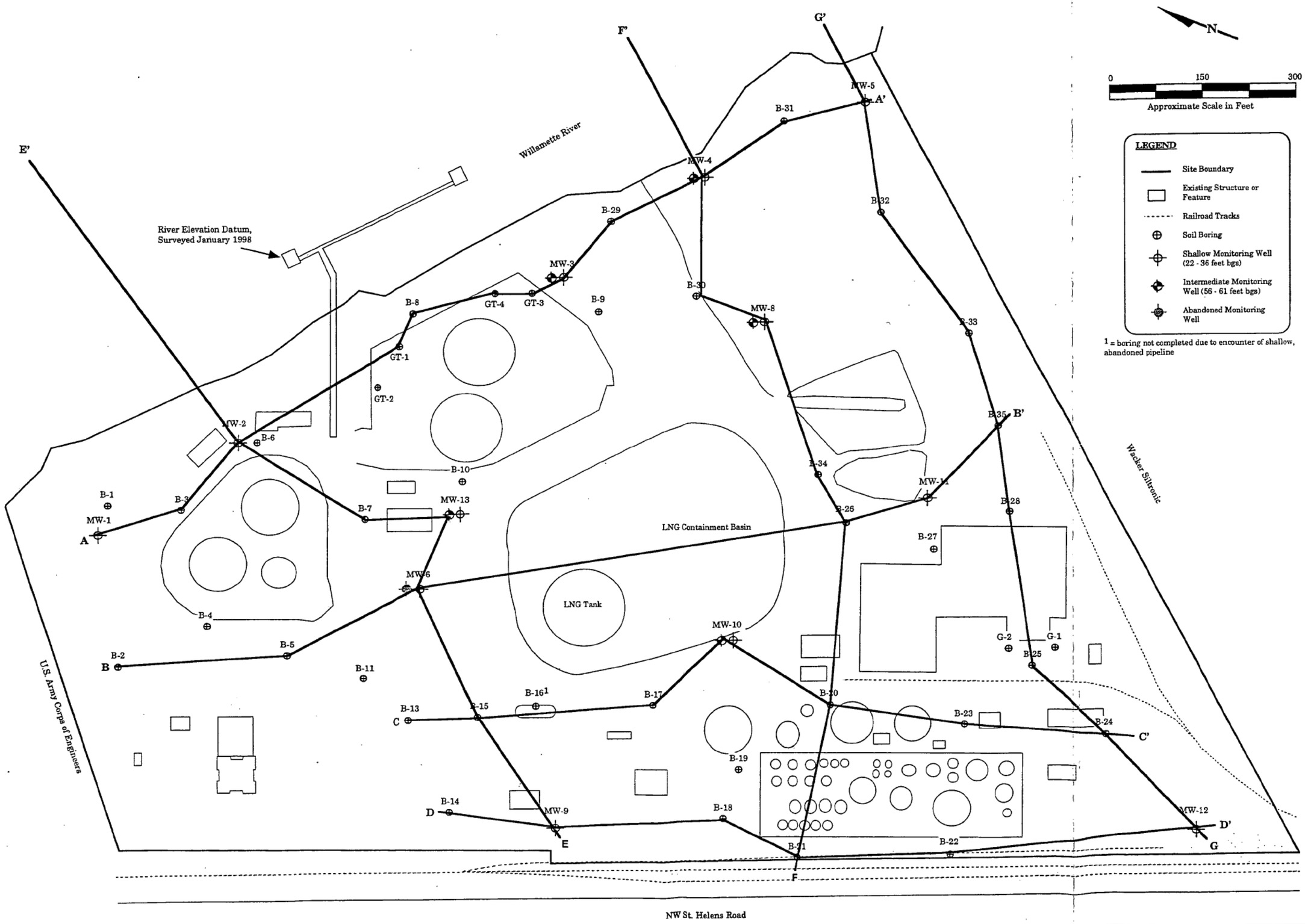


Figure M-1

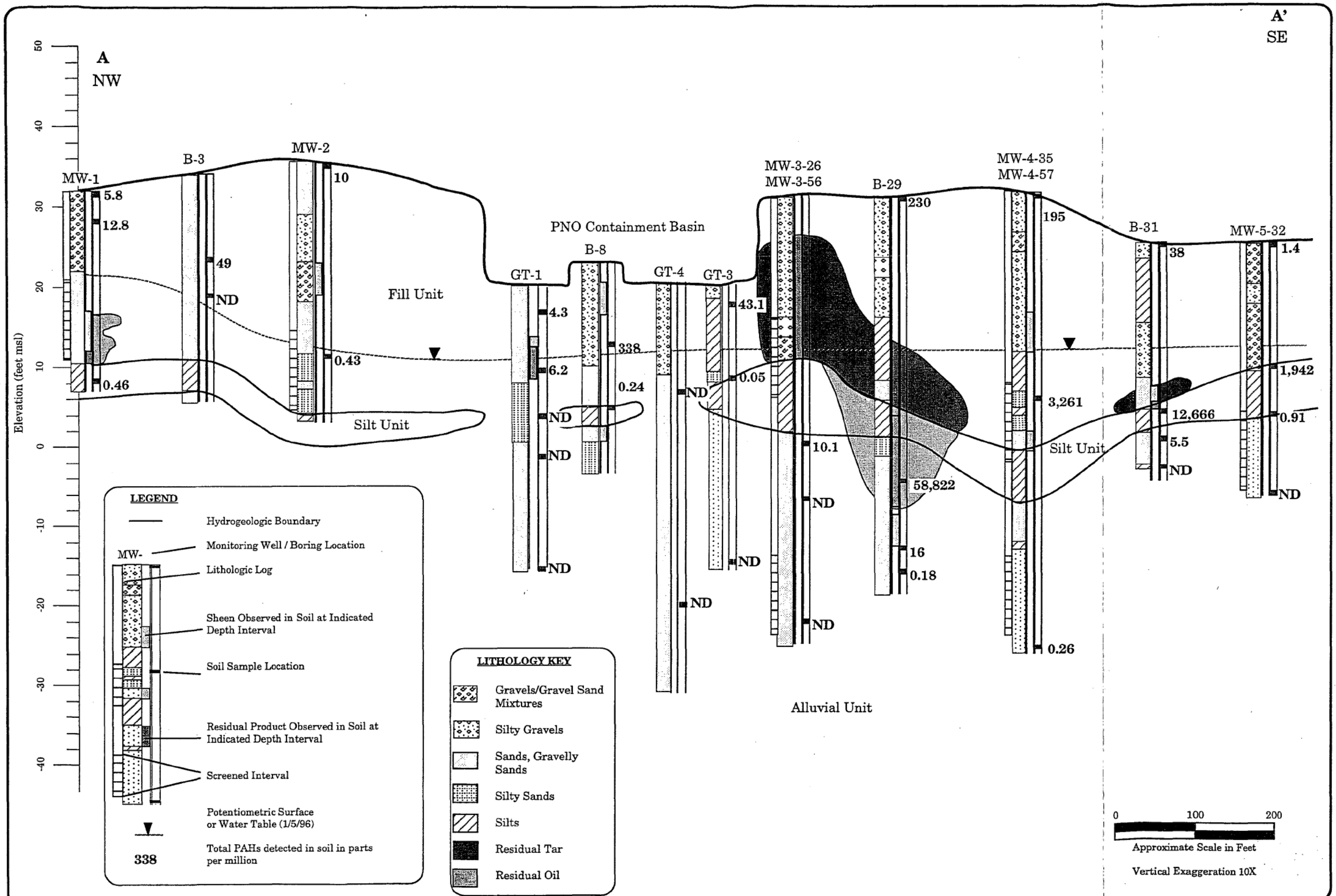
Cross-Section Line Location Map

RI/FS
Northwest Natural - Gasco Facility
7540 NW St. Helens Road
Portland, Oregon

HAHN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

September 1998

Project No. 2708



Figure

M-2

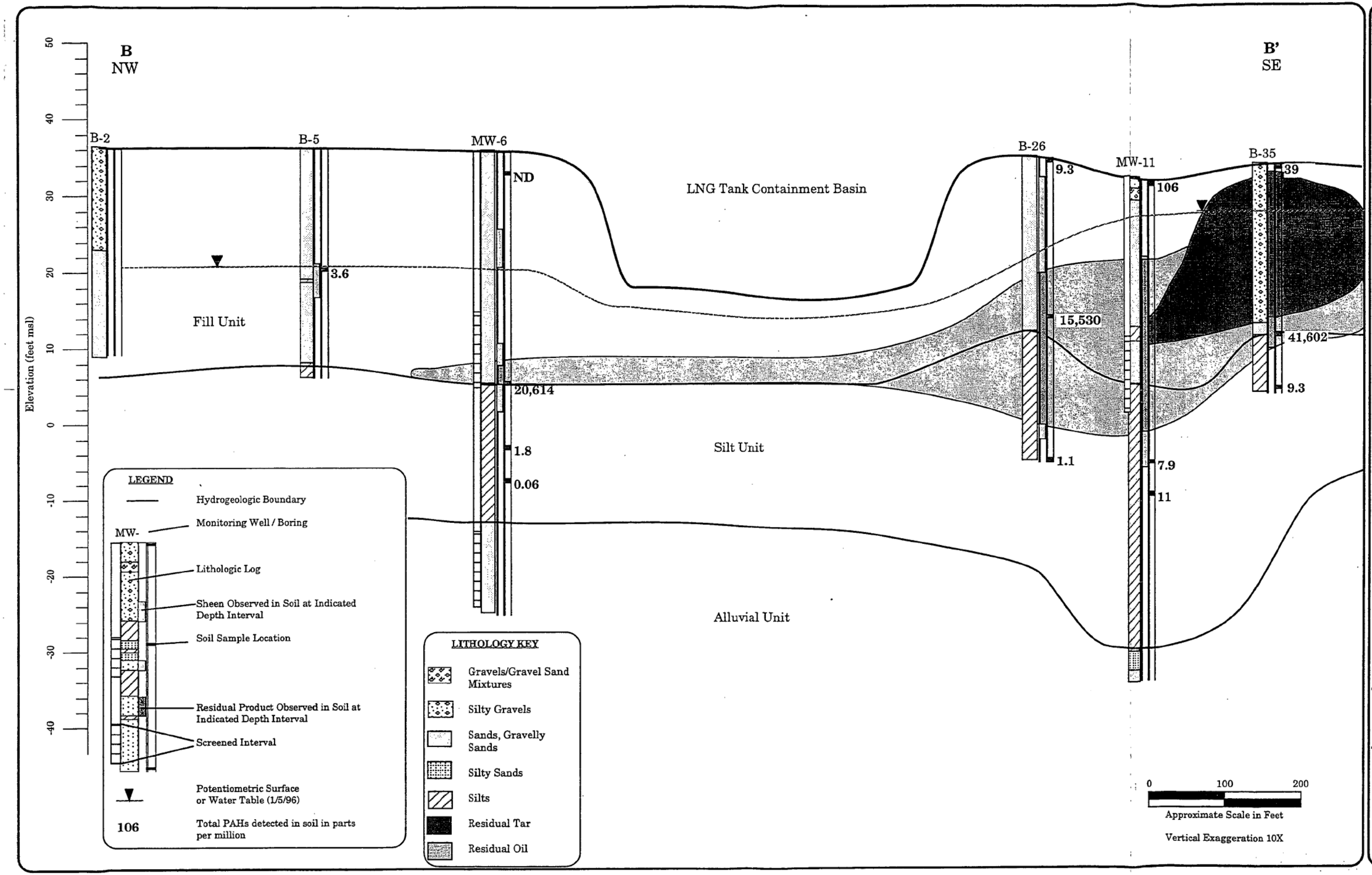
Hydrogeologic Cross Section A - A'
Soil Quality - Total PAHs

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-3

Hydrogeologic Cross Section B - B'
Soil Quality - Total PAHs

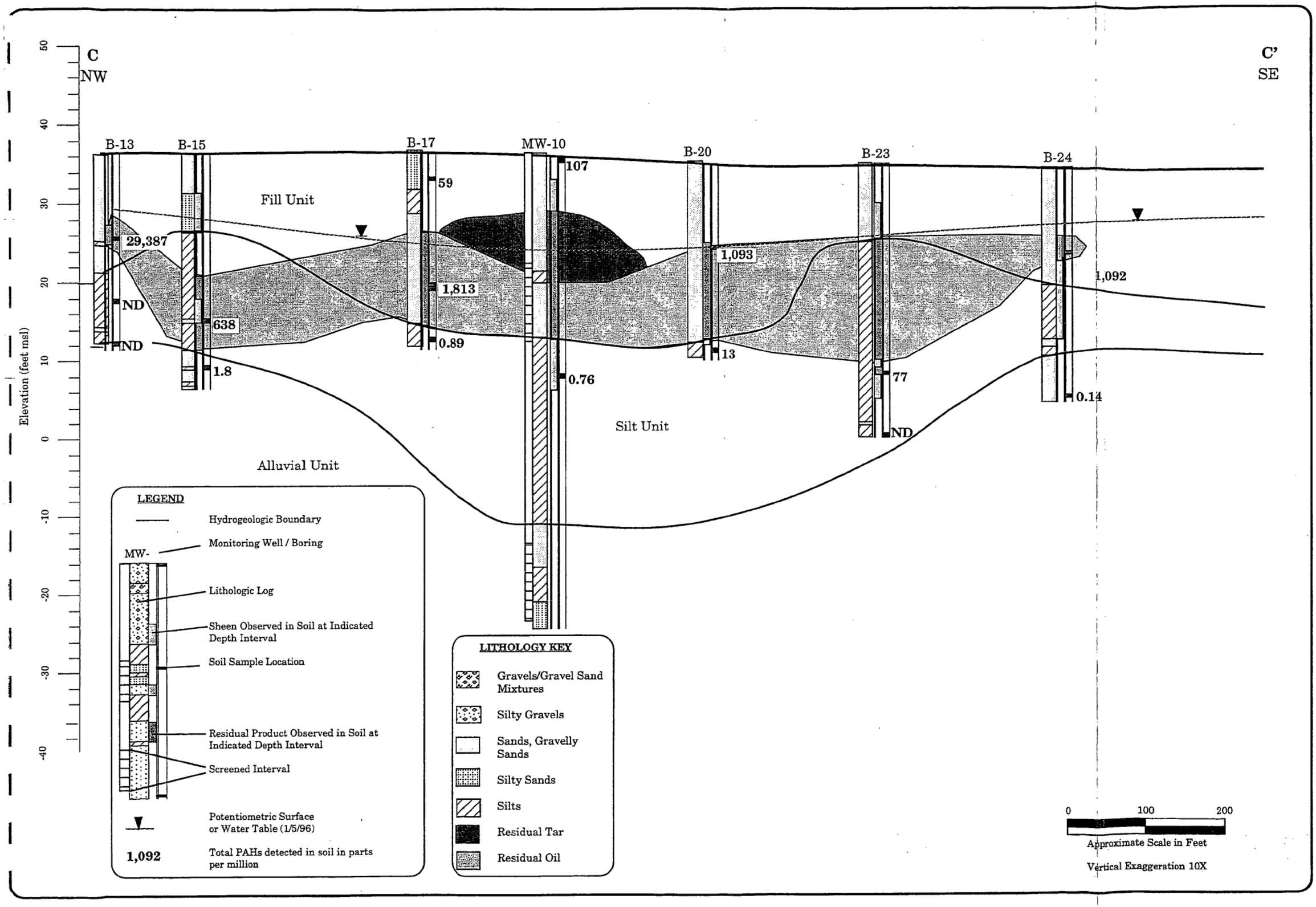
Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-4

Hydrogeologic Cross Section C-C'
Soil Quality - Total PAHs

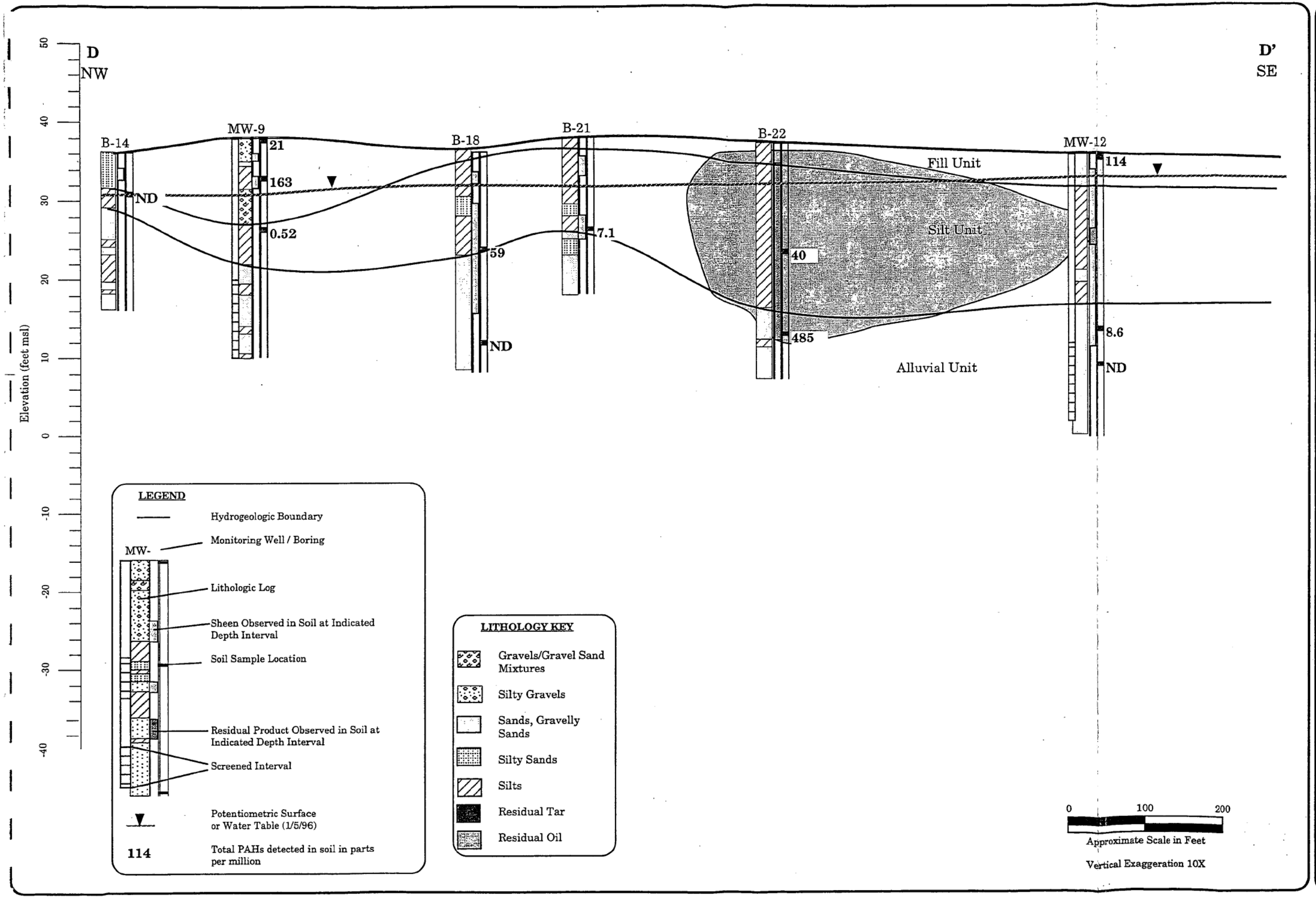
Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-5

Hydrogeologic Cross Section D-D'
Soil Quality - Total PAHs

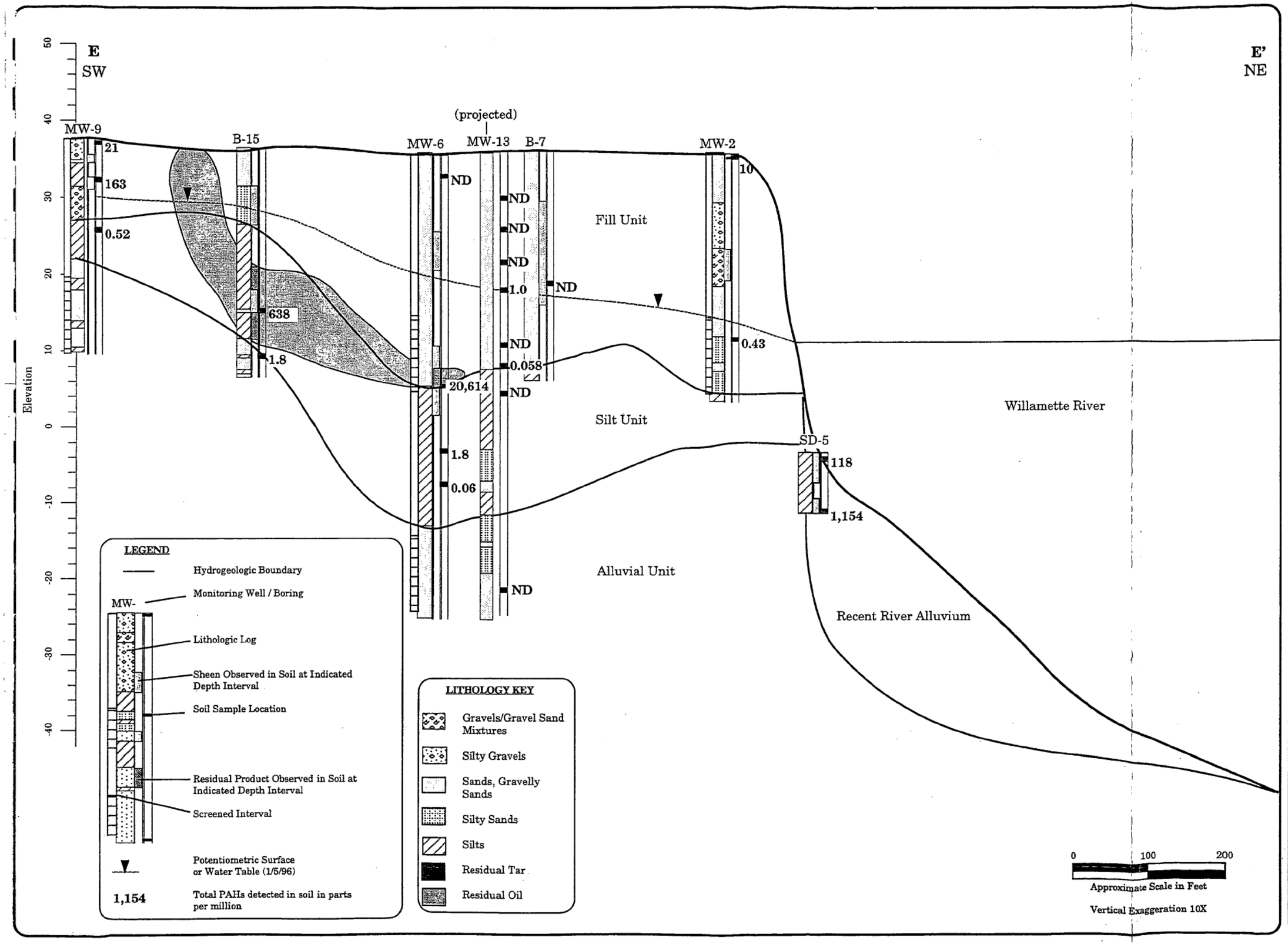
Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-6

Hydrogeologic Cross Section E - E'
Soil Quality - Total PAHs

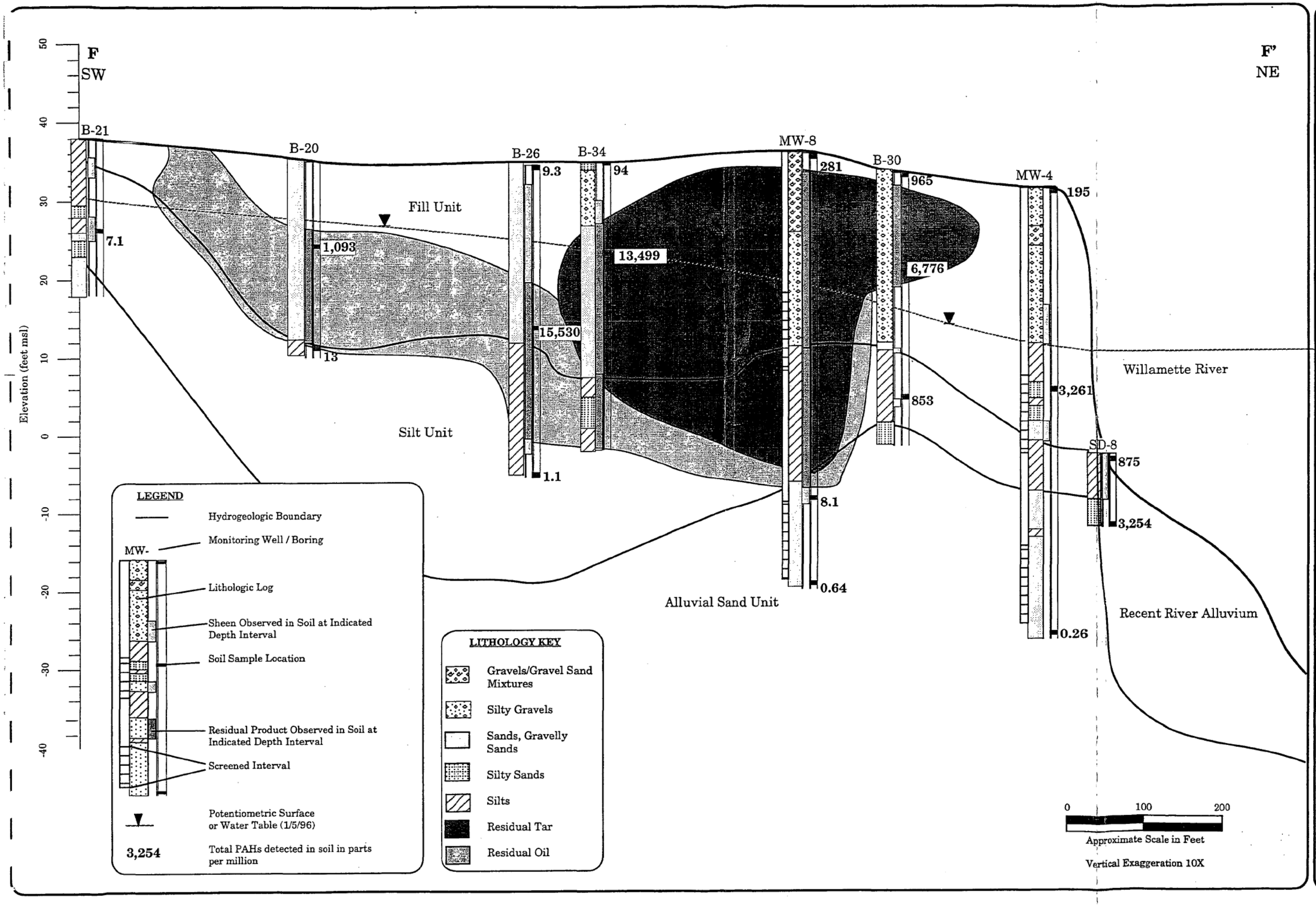
Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-7

Hydrogeologic Cross Section F - F'
Soil Quality - Total PAHs

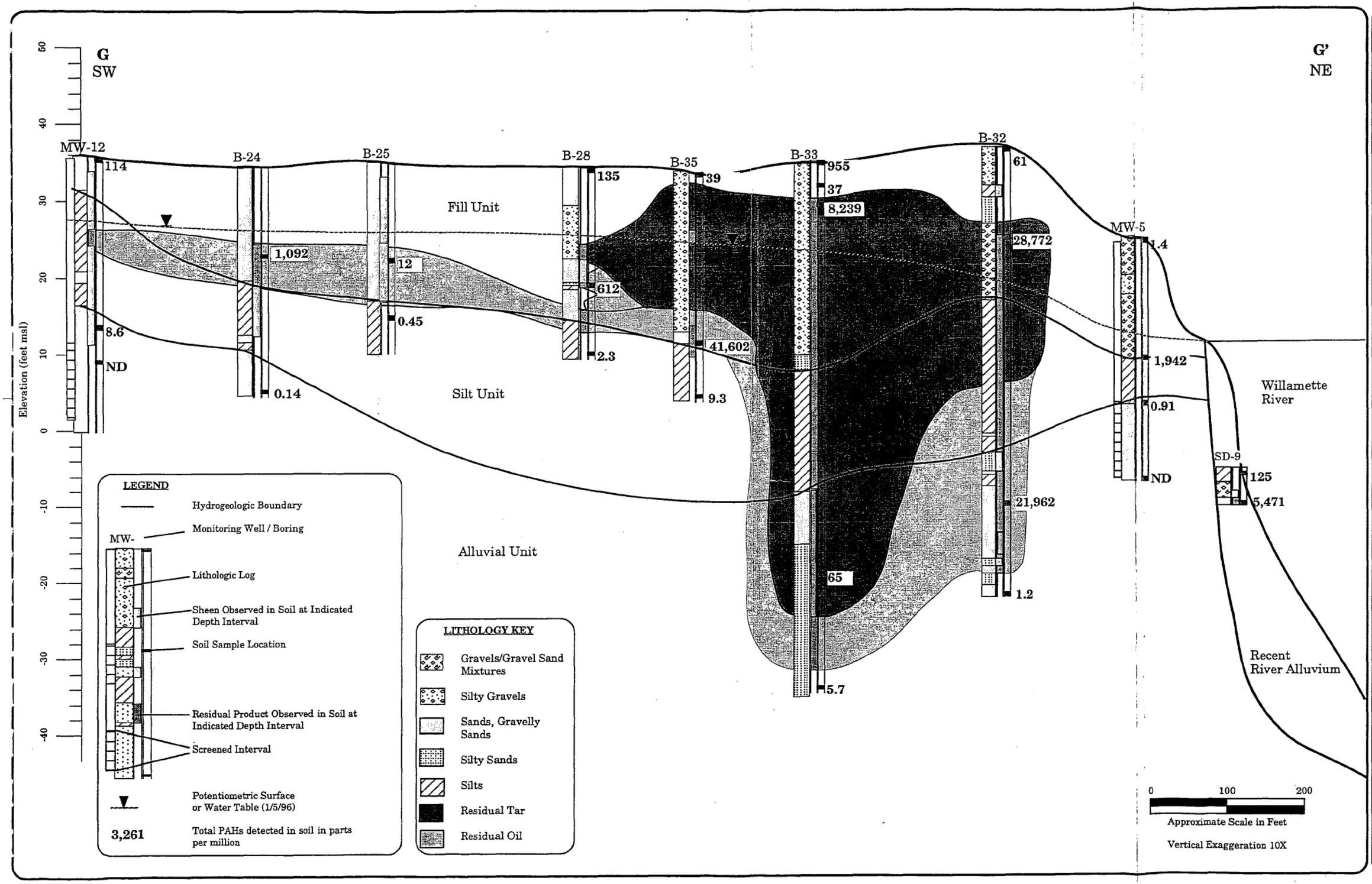
Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708



Figure

M-8

Hydrogeologic Cross Section G - G'
Soil Quality - Total PAHs

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

September 1998

Project No. 2708

SECOND QUARTER 1998

PROGRESS REPORT FOR REMEDIAL INVESTIGATION / FEASIBILITY STUDY ACTIVITIES

Northwest Natural
Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

July 24, 1998

Prepared for:

Northwest Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 2708

As depicted in Figure 1, groundwater flow direction within the shallow (fill zone) groundwater zone was found to be to northeast towards the Willamette River, with an average calculated hydraulic gradient of 0.011.

As depicted in Figure 2, overall groundwater flow direction within the intermediate (alluvial) groundwater zone was found to be to the northeast towards the Willamette River, with a flattening of the gradient within a distance of approximately 300 feet of the riverbank, resulting in a slight groundwater flow reversal being indicated between riverfront wells MW3-56 / MW4-57, and interior well MW8-56. Specifically, a hydraulic gradient of 0.018 (toward the river) was calculated for the central portion of the site, while a gradient of 0.00001 (away from the river) was calculated for the portion of the site located near the river.

1.2 Free Product Evaluation

As described in previous progress reports, an immiscible product that appears to be denser than water has been identified in the lower portion of wells MW-6-32, MW-10-25, and MW-11-32. The thickness of product within each of these wells was measured during the June 1, 1998 monitoring event using an MMC Interface Detector probe. A graph showing measured product thickness within each of these three wells through time is included in Appendix B of this report.

In addition to the above-mentioned measurements, an evaluation to ascertain the presence or absence of light or dense free phase liquid product within key monitoring wells at the site was conducted during the June 1998 groundwater sampling event.

The evaluation for light non-aqueous phase liquid (LNAPL) was conducted by lowering a disposable, clear, PVC bottom-filling bailer such that it was inserted only halfway into the water column of each well, thereby providing for the acquisition of a sample from the top of the water column. The presence or absence of free product floating on the water column surface at each well location was then noted.

The evaluation for dense non-aqueous phase liquid (DNAPL) was conducted in a similar fashion, with the exception that the bailer was lowered to the base of each well thereby providing for the acquisition of a water sample from the lowermost portion of the well. The presence or absence of free product within the water sample, or any free product smearing on the outside of the bailer, was then noted.

Wells that were evaluated as described above include all river-front wells (i.e., wells MW-1-22, MW-2-32, MW-3-26, MW-3-56, MW-4-35, MW-4-57, and MW-5-32) in addition to wells MW-8-29, MW-8-56, MW-10-61, MW-13-30, and MW-13-61. Well MW-13-30 is screened at the top of the silt unit at a location between the Willamette River and well MW-6-31 (an area of known DNAPL occurrence). Wells MW-8-29 and MW-8-56 are installed at the location of the former tar settling ponds at the site, while wells MW-10-61 and MW-13-61 are both screened below the silt unit, with MW-10-61 at a location where the presence

of shallow DNAPL has been documented above the silt unit beneath which this well is screened.

Results of the above-described investigation did not indicate the presence of free product in any of the river-front wells at the site. Additionally, no free product was identified at the MW-8-29, MW-8-56, MW-10-61, MW-13-30, or the MW-13-61 well locations.

1.3 Groundwater Sampling Activities

The eighth groundwater sampling event for monitoring wells at Gasco was initiated on June 1, 1998 and progressed through June 3, 1998. All samples were shipped to American Environmental Network, Inc. (AEN), in Portland, Oregon, and were analyzed in accordance with specifications provided in the revised groundwater sampling plan that was submitted to DEQ on April 3, 1998 (Ede to Urbanowicz) as an addendum to Table 5 of the *Final Remedial Investigation/ Feasibility Study Work Plan*, as modified and approved by DEQ in correspondence dated May 19, 1998 (Blischke to Ede).

A summary of analytical results from the February 1998 sampling event are included as Table 2. The June 1998 data, as well as the seven previous sampling events (December 1995, March 1996, June 1996, September 1996, February 1997, August 1997, and February 1998), are included as Tables 3a through 3c. Analytical results for quality assurance/quality control (QA/QC) samples collected during the June 1998 sampling event are included as Table 4. The laboratory reports and chain-of-custody documentation for this sampling event are included in Appendix C. Additionally, field data sheets that document sampling activities at each monitoring well during the June 1998 sampling event (including well purging and groundwater quality indicator measurements) are included in Appendix D.

Graphs showing benzene and total polynuclear aromatic hydrocarbon (PAH) concentrations in groundwater through time at the site have been prepared and are included in Appendices E and F, respectively.

Northwest Natural has conducted routine groundwater monitoring on a quarterly frequency at the Gasco site from December 1995 until February 1997, with a switch to a semi-annual monitoring frequency occurring in February 1997. During a meeting on February 4, 1998, Ms. Karla Urbanowicz of DEQ requested that Northwest Natural return to a quarterly monitoring program in order to ensure the timely collection of a statistically representative groundwater quality data-set for the site. In response, Northwest Natural proposed revisions to the groundwater monitoring program at the Gasco site in correspondence to the DEQ dated April 3, 1998 (Ede to Urbanowicz).

Conditional approval to implement the proposed modified groundwater monitoring program was provided by DEQ in correspondence dated May 19, 1998 (Blischke to Hart). A summary of the revised groundwater monitoring program for the Gasco site, as conditionally approved by DEQ in the referenced correspondence, is provided as Table 4.

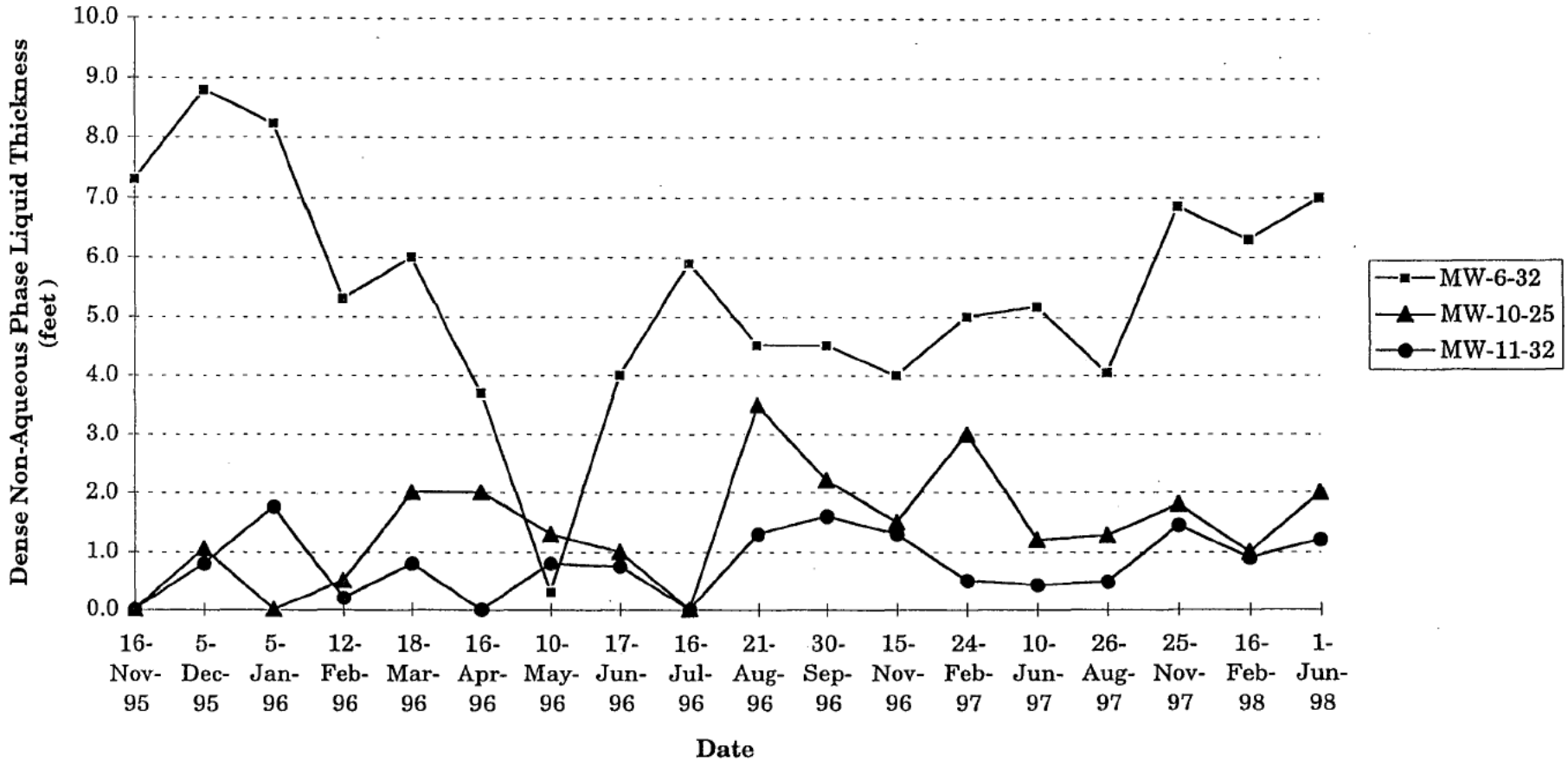
APPENDIX B

Dense Non-Aqueous Phase Liquid Measurements in Monitoring Wells :

MW-6-32, MW-10-25, MW11-32

HAHN AND ASSOCIATES, INC.

Thickness of Dense Non-Aqueous Phase Liquid In Groundwater Monitoring Wells Northwest Natural - Gasco Facility



Updated: 6/22/98 RBE
File: 2708 GW Elevations/ DNAPL Thickness

HAHN AND ASSOCIATES, INC.
Project # 2708

DEPT OF ENVIRONMENTAL QUALITY
RECEIVED

JAN 26 2000

NORTHWEST REGION

INTERIM REMEDIAL ACTION PLAN: DENSE NON-AQUEOUS PHASE LIQUID RECOVERY

REVISION 1

Northwest Natural
Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

January 25, 2000

Prepared for:

Northwest Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 2708

SCOEPA00011162

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT

January 25, 2000

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
811 SW 6th Avenue
Portland, Oregon 97204

HAI Project No. 2708

SUBJECT: Revised Interim Remedial Action Plan: Dense Non-Aqueous Phase Liquid Recovery; Northwest Natural-Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon

Dear Mr. Blischke:

As provided in the First Quarter 1999 Remedial Investigation (RI) Progress Report[1] for the above-referenced site (Figure 1), results of pilot test activities regarding the removal of dense non-aqueous liquid (DNAPL) from three monitoring wells at the Gasco site have indicated that prolonged full scale DNAPL recovery from one of the three well locations (MW-6-32) does appear viable. Based on the preceding, Hahn and Associates, Inc., (HAI), at the request of Northwest Natural, has prepared this plan describing the proposed design and implementation of full scale DNAPL recovery from the MW-6-32 well location. As requested by the Oregon Department of Environmental Quality (DEQ), this work plan has been revised to incorporate comments dated December 21, 1999 (Blischke to Hart), generated as a result of DEQ's review of the November 19, 1999 version of this work plan.

1. BACKGROUND

DNAPL, composed of oil tars, has been observed at the base of three wells at the Gasco site (MW-6-32, MW-10-25, MW-11-32) with typical overall thicknesses ranging from approximately 8 to 10 feet at MW-6-36 and from 0 to 2 feet at MW-10-25 and MW-11-32. As reported by HAI (1999), Northwest Natural conducted pilot scale pumping activities between the dates of December 14, 1998 and January 19, 1999 in order to evaluate the recoverability of DNAPL at each of the three well locations. Well locations are depicted on the site map provided as Figure 2.

The referenced pilot study activities, consisting of DNAPL extraction utilizing a peristaltic pump over a course of 12 events, resulted in the removal of approximately 22 gallons of DNAPL from well MW-6-32; approximately 0.25 gallons from well MW-10-25; and approximately 0.7 gallons from well MW-11-32.

---

[1] Hahn and Associates, Inc., 1999, *First Quarter 1999 Progress Report For Remedial Investigation / Feasibility Study (RI/FS), Northwest Natural - Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon*, June 3, 1999.

434 NW SIXTH AVENUE, SUITE 203 • PORTLAND, OREGON 97209-3600
503/796-0717 OFFICE • 503/227-2209 FAX

Recycled/Recyclable

The pilot study activities found no decline in overall recoverable DNAPL volume through time within well MW-6-32, indicating the potential viability of prolonged full scale DNAPL recovery from this well. Conversely, little to no DNAPL recovery was noted at wells MW-10-25 and MW-11-32 subsequent to the initial removal of product, thereby indicating that the implementation of full scale product recovery at these locations would not be feasible.

DNAPL recovery at the MW-6 location appears to be optimized by the nature of the silt unit in the area of the well. The silt unit, which acts as a barrier to the vertical movement of the DNAPL, appears to be depressed in the vicinity of MW-6, thereby allowing DNAP to "drain" into this well. Also, characterization activities indicated the DNAPL within MW-6-26 to be less viscous than the DNAPL identified within wells MW-10-25 and MW-11-32. The higher DNAPL viscosities at the MW-10-25 and MW-11-32 locations would inhibit the DNAPL mobility, thereby reducing the influx of the DNAPL into each of these wells.

2. INTERIM REMEDIAL ACTION OBJECTIVES

Because no known imminent threat to human health or the environment relating to DNAPL at the site has been identified to date, since continuing migration of DNAPL has not been identified, and since risk assessment activities at the site have not yet been completed, the ultimate need for the incorporation of free product recovery activities into a final remedy for the site has not as of yet been ascertained. As such, remedial action objectives for DNAPL recovery with respect to the final remedy for the site can not yet be stated.

However, because it has been demonstrated that free product exists at the MW-6-32 location with the potential to be recovered via readily available and relatively inexpensive off-the-shelf technology, it is proposed herein that product recovery be implemented at this time, at this location, as an interim remedial action. The objectives of this interim remedial action are as follows:

- To initiate the removal of the most readily-recoverable identified free product from the site at this time.
- To allow for the collection of information necessary for an evaluation of the viability of long-term conventional free product recovery at the site. This information may be used in a feasibility study to assist in the development of a final remedial design for the site, should it ultimately be determined that free product recovery is necessary in order to effectively meet regulatory or yet to be determined risk-based cleanup objectives for the site.

Based on the above interim remedial action objectives, and with the DNAPL recovery system proposed (Section 3), mass removal of the primary site contaminants (benzene and polynuclear aromatic hydrocarbons) will commence in a manner that should maximize the removal of free product while minimizing the removal of groundwater. No exacerbation of contamination (free product or dissolved) at the site due to system operation is predicted due to the low flow and cyclical nature of the proposed product recovery. With the implementation of this interim remedial action, product volume recovery data, with

knowledge of DNAPL distribution in the MW-6 vicinity, should allow for estimates of the potential capture zone for the recovery well. Overall performance data collected during operation of the proposed system will allow for an assessment of the feasibility of this cleanup technique for viable long-term recovery, should such recovery ultimately be a component of overall site cleanup objectives.

3. PROPOSED DNAPL RECOVERY SYSTEM

The proposed product recovery system for well MW-6-32, as diagramed on Figure 3, includes the placement of a 1.79-inch diameter pneumatic pump within the well at a depth above the DNAPL surface. Polyethylene tubing, connected to the bottom of the pump, would then be placed such that it extends into the DNAPL, to a location near the base of the well. The DNAPL would then be pumped, via a strong vacuum, through the product discharge tubing line, to the surface where it will be discharged into an above-ground storage tank.

The use of a 300-gallon double-walled steel storage tank, with 100% secondary containment capacity, is proposed for product containment. According to manufacturer's specifications, the steel of the tank conforms to American Society for Testing and Materials (ASTM) A36 (Standard Specification for Carbon Structural Steel). A comparison of the chemical properties of the DNAPL to be recovered and the tank materials indicates that the DNAPL is chemically compatible with the materials of the proposed tank. As further described in Section 5, the tank will be labeled to indicate that it contains "Discarded Fuel Product for Reclamation". Product will be removed from the tank by opening a 4-inch pump/dispenser port on the top of the tank, lowering in a stinger, and suctioning out the tank contents directly into a tanker truck for delivery to the re-refiner (Section 5).

In addition to secondary containment for the product storage tank, all product piping located outside of well MW-6-32 will be insulated to prevent freezing, and will be placed within a larger diameter pipe in order to provide 100% secondary containment. According to the City of Portland, electric, plumbing, and structural permits are not necessary for installation and operation of the proposed system. The tank and all piping will comply with Uniform Fire Code requirements. Additionally, all product piping will be pressure tested for leaks prior to incorporation into the remedial system

As diagrammed in Figure 3, the system will be operated by a 12-volt battery and compressed air. The battery will be automatically recharged with a solar panel, or if necessary, it will be manually recharged. The compressed air will be provided in cylinders that will require periodic change-outs to maintain the air supply.

The proposed pump, the Xitech ADJ 201, was specifically designed for use at sites where high viscosity DNAPLs such as oil tar or coal tar require recovery. This pump applies a vacuum at the inlet of the pump to withdraw the product from the well, and is designed to provide intermittent low flow removal of DNAPL. As the specifications indicate (Appendix A), this unit can be controlled to pump at any selected rate between a minimum of 0.1 gallons per hour (gph) and a maximum of 13 gph. The pump is intrinsically safe and is chemically resistant to the product being recovered.

It is proposed that the recovery system be operated by an electronic timer that will control the removal of DNAPL at the MW-6-32 location. Specifically, the proposed timer, the Xitech 2500 ES, will provide for individual pumping cycles of 5, 10, 20, 30, or 60 minutes duration, for one of the following number of cycles per day: 1, 3, 6, 12, 24, or 48. The timer will also provide a visual display indicating the level of product within the storage tank, and it will keep record of elapsed pumping time. The timer will also include an automatic shut-off feature to prevent accidental overfilling of the storage tank.

As indicated above, it will be possible to modify flow rate, length of a pumping cycle, and frequency of cycles, as necessary, such that DNAPL recovery at the MW-6-32 location can be optimized, and the withdrawal of water can be minimized.

Initially, various combinations of flow rates, cycle duration, and length of time between cycles will be tested in an effort to determine the optimum pump and timer settings to maximize the overall rate of DNAPL recovery, while minimizing the amount of water that is recovered. At a minimum, based on pilot testing completed at the MW-6-32 location, it is known that removal of at least 1 to 2 gallons of DNAPL per day should be feasible, assuming a 1-cycle per day pumping frequency.

Due to the presence of vehicular traffic in the vicinity of well MW-6-32, it is proposed that the above-ground portion of the system be enclosed and secured with fencing, and that protective guard posts, similar to those surrounding existing above-grade monitoring wells at the site, be placed around the fenced area.

4. SYSTEM OPERATION AND MAINTENANCE AND REPORTING

System performance and operation will be evaluated daily for the first week after start-up, and at least weekly thereafter for the first month of operation. Based on system performance as observed during the first month of DNAPL recovery, an Operation and Maintenance (O&M) schedule will be developed such that battery recharging and air cylinder replacement may be conducted, and such that the volume of recovered liquids can be recorded.

With regard to reporting, results of DNAPL recovery at MW-6-36 will be provided within the routine Quarterly RI Progress Reports that are currently submitted to DEQ within 30 days following the end of each Quarter. To be included within each report will be an identification of the current system control settings (pump rate, cycle duration and frequency); system operation time since last report; to date cumulative system operation time; DNAPL recovered since last report; to date cumulative DNAPL recovered; as well as an identification of system O&M schedule and a description of any O&M issues.

5. PROPOSED DNAPL MANAGEMENT

It is proposed that recovered DNAPL be managed as per DEQ Policy Number 96-002, Petroleum Contaminated Wastewater Management (Appendix B). As per the referenced guidance, petroleum contaminated wastewaters generated as result of fuel management activities may be managed as commercial chemical product, provided the mixture only

contains unused fuel and water, and the fuel portion is legitimately reclaimed and used as commercial fuel.

As per the guidance, petroleum contaminated wastewaters include water/fuel mixtures that are generated as a result of fuel product spills. Characterization of the DNAPL (HAI, 1999) indicates it to be inherently fuel-like, and re-refiners have been identified that will process the recovered DNAPL/water mixture for commercial sale as bunker / marine fuel. Based on the preceding, the DNAPL at Gasco does meet the requirements of the DEQ Policy Number 96-002, and in compliance with this standard, the recovered DNAPL will be neither a RCRA solid waste or hazardous waste, assuming re-refinement of the material does occur. However, as per a Hazardous Waste Characterization Worksheet completed for the DNAPL (Appendix C), if re-refinement of the DNAPL does not occur, then once recovered, the DNAPL would be a characteristic RCRA hazardous waste due to benzene concentrations (RCRA Waste Code D018).

In support of the above, Mr. Kevin Masterson with the Pollution Prevention and Hazardous Waste Technical Assistance Program at the Oregon Department of Environmental Quality (DEQ) Northwest Region, during a telephone conversation on February 19, 1999 (Ede to Masterson), indicated that management of the recovered DNAPL as petroleum contaminated wastewater per DEQ policy Number 96-002 appears appropriate and acceptable. Notes documenting the February 19, 1999 telephone conversation with Mr. Masterson are included within Appendix B.

6. PROPOSED INSTALLATION AND START-UP SCHEDULE

It is proposed that the system be installed and operational within 3 months of receipt of DEQ-approval of this interim remedial action plan.

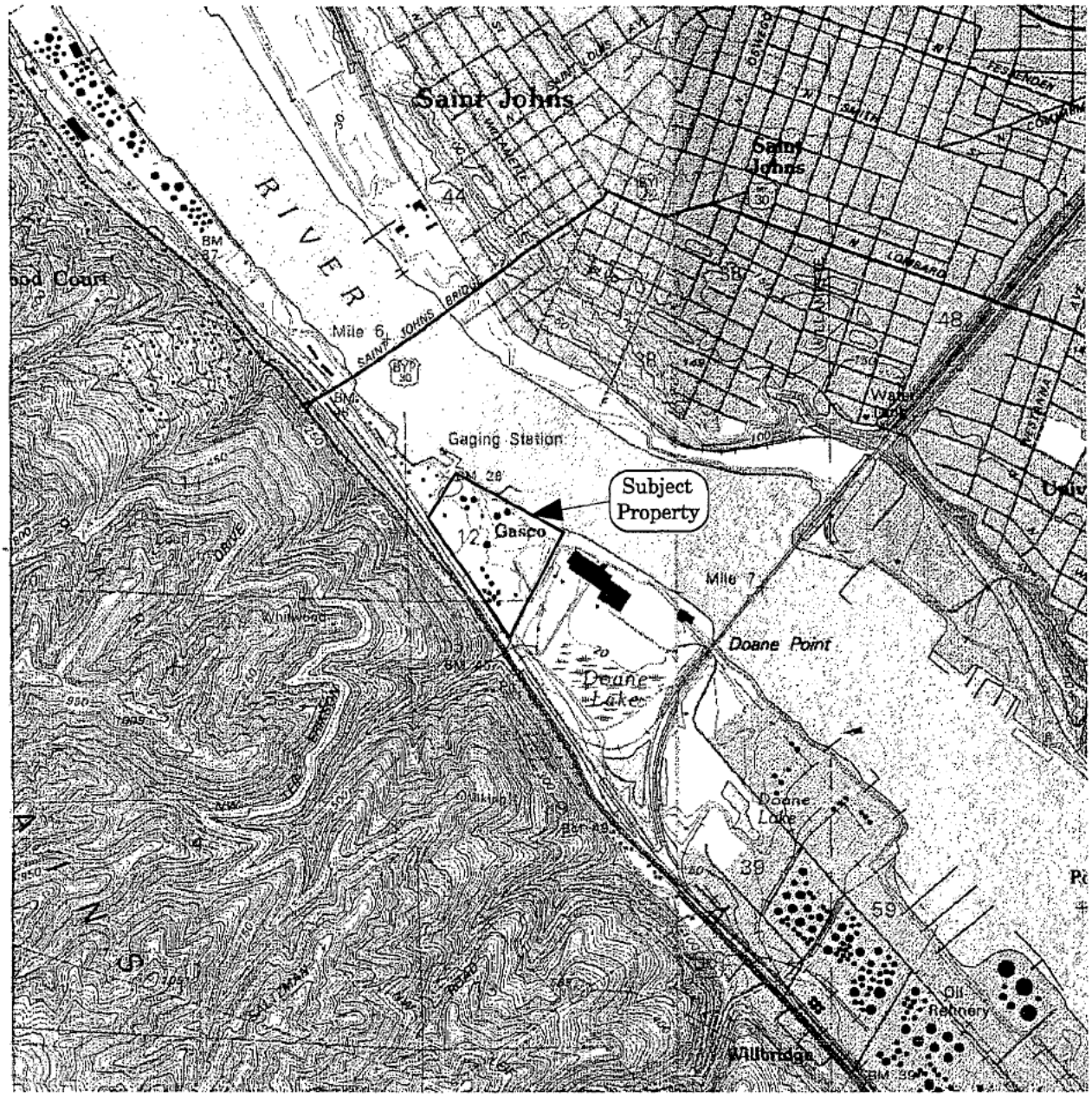
If there are any comments or questions, please contact the undersigned.

Sincerely,

Robert Ede
Sr. Project Manager

c: Ms. Sandra Hart, Northwest Natural
Mr. Richard Bach, Stoel Rives LLP (2)
Mr. Frank Selker, Decision Management Associates, LLC
Mr. Tom Schadt, Anchor Environmental, LLC

FIGURES



0 2,000 4,000

Scale in Feet
Contour Interval = 10 feet

N

Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5 Minute Quadrangles

Project No. 2708	HAHN AND ASSOCIATES INCORPORATED	LOCATION MAP	FIGURE
September 1999	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 (503) 796-0717	Northwest Natural Gasco Facility 7900 NW St. Helens Road Portland, Oregon	1

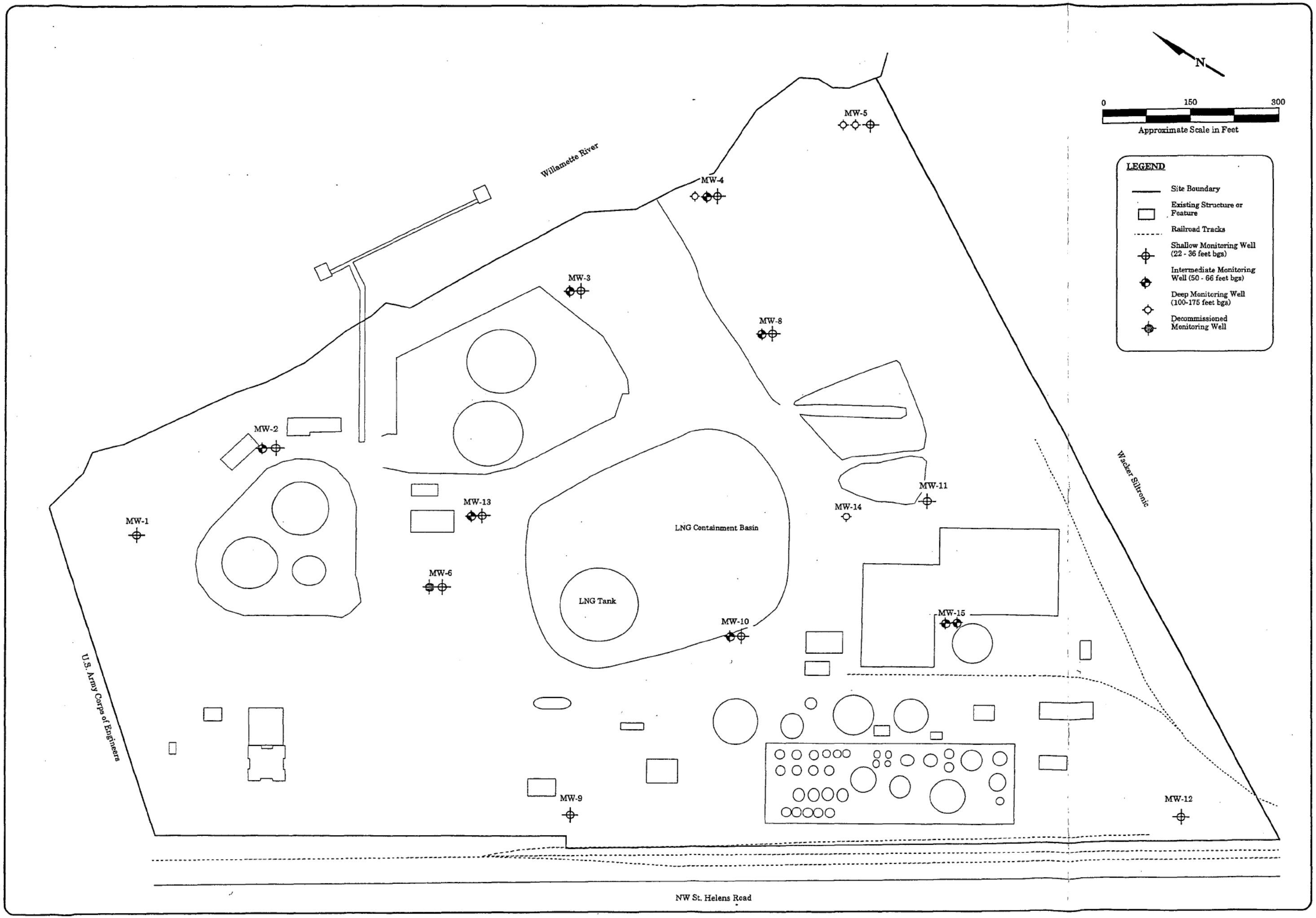


Figure 2

Monitoring Well and Soil Boring Location Map

Remedial Investigation
Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

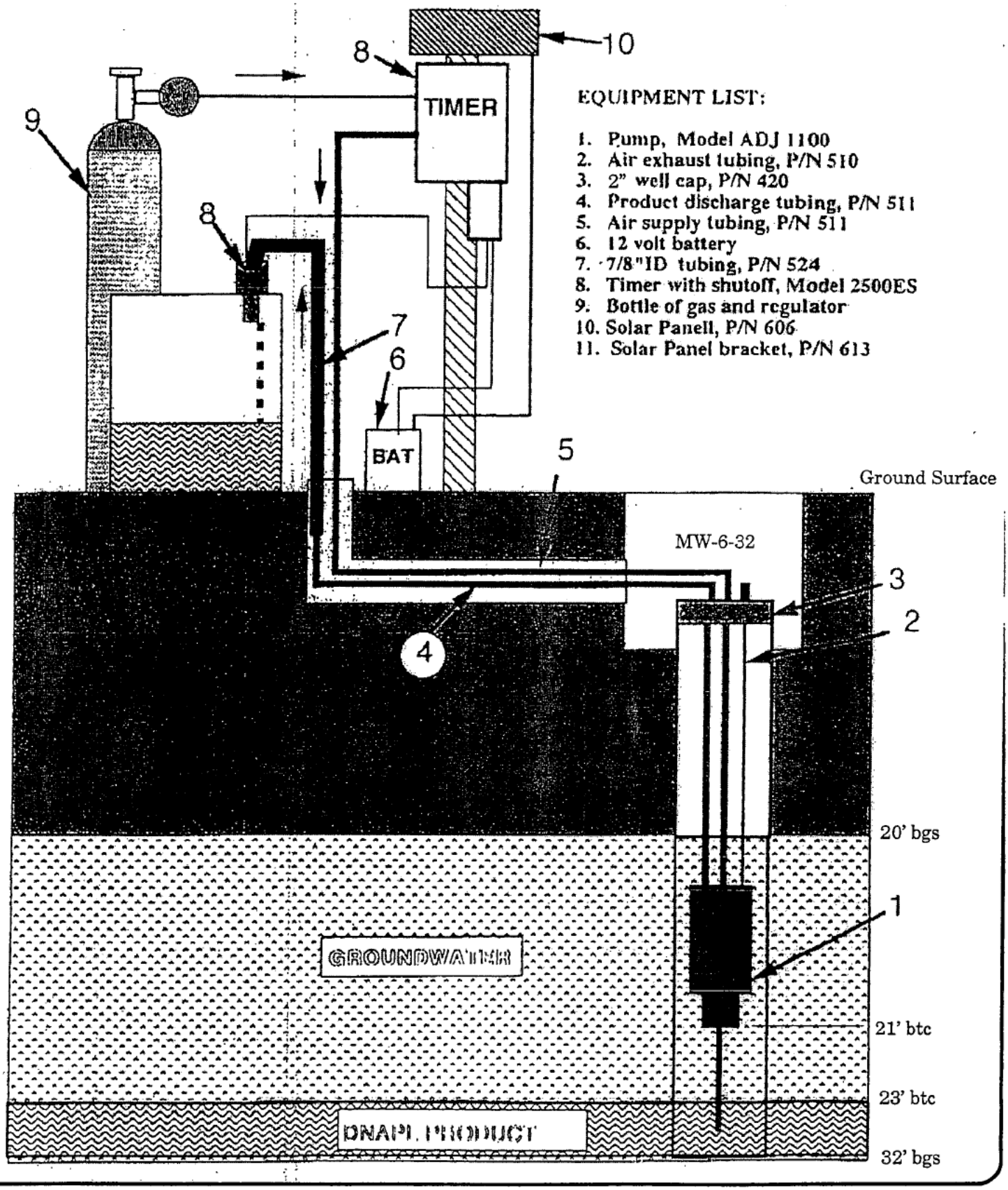
HAHN & ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

January 2000

Project No. 2708

XITECH DNAPL RECOVERY SYSTEM
Without the use of AC Power



EQUIPMENT LIST:

1. Pump, Model ADJ 1100
2. Air exhaust tubing, P/N 510
3. 2" well cap, P/N 420
4. Product discharge tubing, P/N 511
5. Air supply tubing, P/N 511
6. 12 volt battery
7. 7/8"ID tubing, P/N 524
8. Timer with shutoff, Model 2500ES
9. Bottle of gas and regulator
10. Solar Panell, P/N 606
11. Solar Panel bracket, P/N 613

Project No. 2708	**HAHN AND ASSOCIATES** INCORPORATED	**Proposed DNAPL Recovery System: Well MW-6-32**	**FIGURE**
September 1999	ENVIRONMENTAL MANAGEMENT 434 NW SIXTH AVENUE, SUITE 203 PORTLAND, OREGON 97209 (503) 796-0717	Northwest Natural Gasco Facility 7900 NW St. Helens Road Portland, Oregon	3

APPENDICES

APPENDIX A

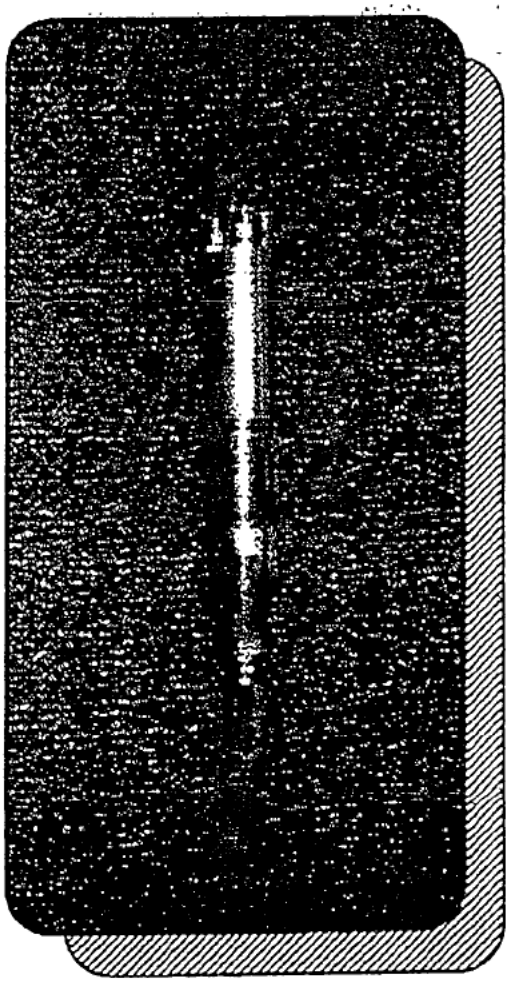
Specifications:

XITECH ADJ 201 DNAPL Recovery Pump and XITECH 2500ED Electronic Timer

SCOEPA00011173

2" DNAPL Recovery Pump

The ADJ 201Pump was designed to produce a high vacuum at the inlet of the pump to recover high vescosity DNAPLs like Coal-tar. The ADJ 201 is completly resistant to solvents like perchroloethylen, can be operated on bottled gas, is intrinsically safe, and can be installed in less than 1 hour. The ADJ 201 requires no above ground controls to operate, Easily fits into a 2" well, pumps over 13 GPH, and consumes less than .5 CFM of air. The Xitect Programmable Site Managers provide intermittent pumping control for the ADJ 201 Pump, continuous electronic monitoring of the high level tank shutoff sensor, display of total pumping time, and operates on a 12DC or 120AC or 220AC power source.



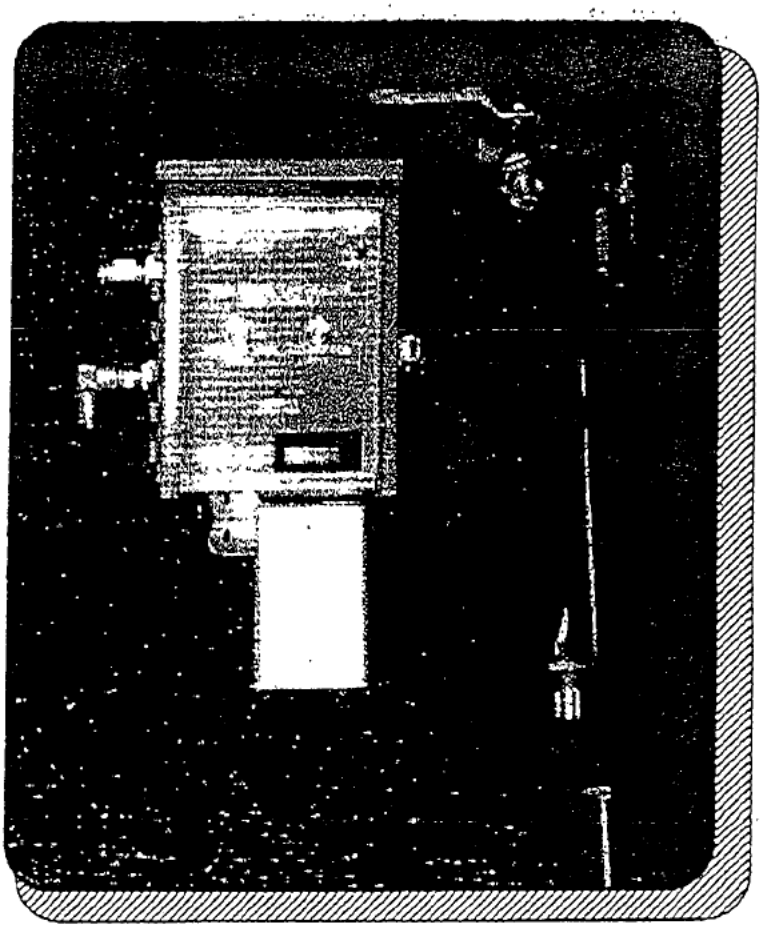
U.S. Patent# 5,326,458

Specifications

Pumping range: .1 GPH - 13 GPH
Operating pressure range: 35-125 PSIG
Maximum operating well depth: 200 feet
Maximum air requirements: .5 CFM @ 125 PSIG
Air quality requirements: 5-10 Microns
Size: 1.79" DIA. X 9" L
Weight: 3 LBS
Materials : SST, Viton, Aluminum
Order No. **ADJ 201**

2500ES Electronic Timer

The 2500ES Electronic Timer requires no programing, provides intermittent pumping control for the ADJ Skimmers and Pumps, continuous electronic monitoring of the high level tank shutoff sensor, displays total run time of system, and operates on a 12DC or 120AC power source. The electronic high level shutoff assembly has a three way product inlet switching valve, double wall tubing fitting to double contain the product line, and an infrared electronic liquid level sensor that is intrinsically safe.



Specifications

Intermittent pumping control
Pumping times
(MINS):5,10,20,30,60,CONT.
Pumping cycles per day: 1,3,6,12,24,48
Infrared sensor tank over-fill protection
Visual indicator displays tank full condition
Elapsed pumping timer in hours and minutes
Power: 12DC&110AC, or 12DC, 220AC
Size: 8" X 6" X 4" NEMA 3R enclosure
Weight: 8 Lbs
Tank Sensor assembly requires a 2"NPT
Order No. **2500ES**

APPENDIX B

Department of Environmental Quality Policy 96-002: Petroleum Contaminated Wastewater Management

Telephone Record: Ede to Masterson, February 19, 1999

Department of Environmental Quality Policy 96-002:
Petroleum Contaminated Wastewater Management

HAHN AND ASSOCIATES, INC

Hazardous Waste/Toxics Use Reduction
Policy Clarification

POLICY TITLE: Petroleum Contaminated Wastewater Management

POLICY NUMBER: 96-002

EFFECTIVE DATE: Upon all managers approval

PURPOSE:

This policy is intended to establish guidance for petroleum contaminated wastewater generated from fuel management activities. The policy describes types of wastewaters encountered and how the wastewater should be managed. This policy replaces existing Department policy regarding the management of fuel contaminated wastewaters.

POLICY DESCRIPTION:

Petroleum contaminated wastewaters generated as result of fuel management activities may be managed as a commercial chemical product and not as solid or hazardous waste provided the mixture only contains unused fuel and water, and the fuel portion is legitimately reclaimed and used as a commercial fuel. Petroleum contaminated wastewaters include, but are not limited to, fuel storage tank bottom water, water/fuel mixtures that are generated as a result of fuel product spills, and water collected from secondary containment and sumps. Petroleum contaminated wastewater **does not include** tank cleaning wastes, washwater, wastewater containing hazardous constituents not found in the petroleum product, tank bottom sludges, bilge water or manufacturing wastewater.

For the petroleum contaminated wastewater to be managed as a commercial chemical product, exempt from regulation as a hazardous or solid waste, the generator must:

- determine that the material contains a sufficient amount of reclaimable fuel product;
- manage the material in an environmentally sound manner prior to reclamation;
- ensure that the facility reclaiming the fuel product is able to demonstrate (to both the generator and the Department) that legitimate reclamation is occurring; and,
- the recovery facility properly manages the wastewater as a solid waste and thus a potential hazardous waste when it is disposed.

DISCUSSION:

Prior to the EPA's inclusion of benzene as a toxic constituent under the Toxicity Characteristic Leaching Procedure (TCLP) in 1990, wastewaters such as these were not normally considered hazardous unless they exhibited the hazardous waste characteristic for ignitability. Wastewaters contacting gasoline will likely exhibit the hazardous waste characteristic for benzene.

For a waste to be a hazardous waste, it must first be a solid waste (40 CFR 261.3). To determine whether a material is a solid waste when reclaimed, it must first be determined whether the material is a spent material, sludge, by-product, commercial chemical product, or scrap metal. Table 1 of 40 CFR 261.2 specifies that commercial chemical products going for reclamation are not solid wastes. For the purpose of this discussion, a commercial fuel product is a mixture of water and an unused fuel product that will be reclaimed and the recovered product used as a fuel. EPA has stated[1] that product/water mixtures would be considered to be an off-specification product and would be excluded from being a solid waste when it is intended to be recovered.

Legitimate Reclamation Determination:

When determining if legitimate reclamation of a commercial product is occurring, the following criteria shall be considered:

1. Is the material more product-like or more waste-like? The more fuel product that can be reclaimed from a mixture makes it more likely that legitimate recovery is occurring. Depending on the recovery process, the mixture should contain at least 5% recoverable fuel product. Wastewater containing no floating fuel product will not be considered to be reclaimable unless the recovery facility can successfully demonstrate that legitimate reclamation is occurring.
2. Is the material being managed in a manner consistent with the management of new commercial fuel product and not waste? To be considered a reclaimable material, the fuel/water mixture must be managed in a closed, labeled container or tank in good condition (e.g., not leaking, no visible signs of rusting or deterioration).
3. How is the material managed at the reclamation facility? The material must be managed according to industry standards for fuel products at the reclamation facility and the recovered fuel product must be either used as a fuel or blended with other fuels. All residual wastewater resulting from the reclamation process must be managed properly as a waste.
4. How much product is actually recovered from the mixture? The reclamation process should be able to recover and utilize most if not all the fuel product from a mixture. Low recovery efficiencies indicate that the reclamation may be primarily treatment and not legitimate reclamation.

   How is residual wastewater managed once fuel product has been removed? Residual wastewater must be properly disposed of under a wastewater discharge permit issued by the state or local government.

Letter dated June 14, 1991 from Don R. Clay, EPA Assistant Administrator (attached).

Telephone Record: Ede to Masterson, February 19, 1999

SCOEPA00011180

TELEPHONE COMMUNICATION RECORD

Hahn & Associates, Inc.
434 NW Sixth Avenue, Suite 203
Portland, Oregon 97209
(503) 796-0717
Fax (503) 227-2209

Phone Call In _____ Phone Call Out _X_	Route to:	Date: 2/19/99
Project #: 2708	Acronym:	Time: 10:30
Project Name: Northwest Natural: DNAPL Recovery		By: Rob Ede
Person: Mr. Kevin Masterson	Affiliation: ODEQ; Hazardous Waste Technical Assistance	Phone Number: 503- 229-561
Address:	Subject: DNAPL Management at Gasco	Fax Number: ( )

Based on information provided, Kevin stated his opinion that recovered DNAPL at Gasco would not be considered a RCRA solid or hazardous waste (as long as the DNAPL is re-refined), nor would it best be regulated as Used Oil . Instead, the DNAPL would be considered "Discarded Chemical Product" to be managed as "Discarded Fuel Product". Kevin indicated that he would send over applicable guidance document regarding management of discarded fuel product(DEQ Policy 96-002) for my review and use. Kevin indicated that no prior approval from DEQ to manage the DNAPL as discarded fuel product is needed -but do need to meet all of the requirements of the referenced guidance document.

FOLLOW UP:

APPENDIX C

Hazardous Waste Determination Worksheet

SCOEPA00011182

SOLID/HAZARDOUS WASTE CHARACTERIZATION WORKSHEET

Facility: Northwest Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

HAI Project #: 2708-50
EPA ID #: OR0000204701
Completed by: Robert B. Ede

The waste is classified as **HAZARDOUS** / **NON-HAZARDOUS** (circle one) based on the following:

* if Reclaimed

1) Describe the waste generation process: Previously spilled free product oil tar, a source for/product of a former oil gasification facility that generated fuel for lighting and heating, and existing as a dense non-aqueous phase liquid (DNAPL) perched on a silt confining unit below the water table, is to be extracted from below the ground surface at the current MW-6-32 well location. It is anticipated that the recovered DNAPL will contain some incorporated groundwater, not to exceed 95%. The recovered DNAPL/groundwater emulsification will be reclaimed (re-refined) for reuse as a fuel. The DNAPL removal is being completed as an Interim Remedial Action at the site.

2) Is this waste a **solid waste**? (40 CFR 261.2 and exclusions 40 CFR 261.4) NO if reclaimed (See 40 CFR 261.2, Table 1 and ODEQ Policy No. 96-002); YES if not reclaimed

3) Is this waste a **listed hazardous waste**? N/A if reclaimed, NO if not reclaimed

F-Listed (40 CFR 261.31): Wastes from non-specific sources NO

K-Listed (40 CFR 261.32): Wastes from specific sources NO

P-Listed (40 CFR 261.33): Discarded commercial chemical product NO

U-Listed (40 CFR 261.33): Discarded commercial chemical product NO

4) Has the waste been excluded under 40 CFR 261.4? NO

5) Is the waste a **characteristic hazardous waste**? N/A if reclaimed; YES if not reclaimed (analytical results attached)

Ignitable (40 CFR 261.21)	N/A if reclaimed, otherwise NO
Corrosive (40 CFR 261.22)	N/A if reclaimed, otherwise NO
Reactive (40 CFR 261.23)	N/A if reclaimed, otherwise NO
Toxic (40 CFR 261.24)	N/A if reclaimed, otherwise YES

6) Is the waste a **state-only hazardous waste**?

Residue containing 3% or greater of any P-listed waste NO

Residue containing 10% or greater of any U-Listed waste NO

7) Is the hazardous waste excluded as a recyclable material (e.g. used oil that is re-refined, scrap metals, used batteries returned to proper facilities) (40 CFR 261.6(a)). NO

EPA or State Waste Codes: Discarded Chemical Product if Reclaimed; otherwise D018 (Benzene)

Signature: [illegible] Date: 1/17/2000

40 CFR 261.4 HAZARDOUS WASTE EXEMPTIONS

261.4(a) FOLLOWING MATERIALS ARE NOT A SOLID WASTE

1) Domestic Sewage and waste that passes through a sewer system to a publicly-owned treatment works.
2) Industrial Wastewater point source discharges subject to Clean Water Act (NPDES)
3) Irrigation Return Flows.
4) Special Nuclear Material, source or by-product as defined by the Atomic Energy Act of 1954.
5) In-Situ Mining Materials, not removed from the ground during extraction process.
6) Pulping Liquors, reclaimed in recovery furnace and then reused, unless speculatively accumulated (261.1(c)).
7) Spent Sulfuric Acid used to produce virgin sulfuric acid, unless speculatively accumulated.
8) Secondary materials that are reclaimed for reuse in the production process(es), provided:
   i) only tank storage with closed system piping;
   ii) reclamation does no include combustion (such as boilers, industrial furnace or incinerator);
   iii) materials must be reclaimed within 12 months; and
   iv) reclaimed material is not used to produce a fuel or into products that constitutes disposal.
9) Spent Wood Preserving Solutions or Wastewaters that are reclaimed and reused for their original purpose.
10) Specified EPA K-Wastes and Coke By-Products that are only hazardous for toxicity characteristics, if the materials are recycled to coke ovens, tar recovery process, or mixed with coal tar prior to the tar's sale or refining, provided there is no land disposal of the material between recycling and re-use.

261.4(b) SOLID WASTES THAT ARE NOT HAZARDOUS WASTES

1) Household Wastes (residences, hotels/motels, bunkhouse, ranger stations, crew quarters, camp grounds, picnic grounds and day-use recreation areas).
2) Growing/Harvesting Crops and Raising Animal (incl. manure) Materials, used as soil fertilizers.
3) Mining Overburden returned to mine site.
4) Fly and bottom Ash, Slag, and Flue-Gas Emission Control Wastes, generated primarily by coal or fossil fuel combustion, provided that hazardous wastes are not received for combustion.
5) Drilling Fluids, Waters and Other Wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy.
6) TC Chromium Wastes, if the waste and chromium used in the process is exclusively (or nearly) trivalent, and it is used in a non-oxidizing environment (specific examples - mostly related to tanning process are in regs.).
7) Ore and Mineral Wastes from extraction, benefication and processing, except for facilities that receive hazardous waste (see regs. for details).
8) Cement Kiln Dust Waste, except for facilities that receive hazardous waste.
9) Discarded Arsenical-Treated Wood or Wood Products (TC D004-D017 only), if the materials are utilized for an intended end use.
10) Petroleum-Contaminated Media and Debris (TC D018-D043 only), that are regulated by 40 CFR 280.
11) Injected Ground Water (TC D018-D043 only) at petroleum extraction, reclamation, storage facility site remediations. (see regs. for details)
12) Used Chlorofloro Carbons (CFC) from totally enclosed heat transfer (refrigeration) equipment (mobile or fixed), if reclaimed for further use.
15) Used Oil Filters, (non-terne plated) if gravity hot-drained. (see regs. for details)

261.4(c) IN-PROCESS HAZARDOUS WASTES; e.g. generated in a raw or product process, until it leaves said process or the process has been shut down for 90-days (at which time the 90-day containerized storage clock starts)
(see regs. for details)

261.4(d) ENVIRONMENTAL SAMPLES (see regs. for details)

261.4(e) TREATABILITY STUDY SAMPLES (see regs. for details)

261.4(f) SAMPLES UNDERGOING TREATABILITY STUDIES AT LABORATORIES AND TESTING FACILITIES (see regs. for details)

TC = a waste that is hazardous for toxicity characteristic only

Attachment

Analytical Results and Chain-of-Custody Documentation: December 1998 DNAPL Characterization

HAHN AND ASSOCIATES, INC.

NCA

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory Environmental Services Laboratory, Inc. TBR
17400 SW U. Boones Ferry Rd., Portland OR
Lab Project No. P812258

2708-FP001
Page 1 of 1

COPY

Project Manager: Rob Ede
Project No.: 2708-50
Project Name: Northwest Natural - Gasco
Collected by: Rob Ede /Jay Greifer

Liquid with Sediment Sample
___ Test Filtrate ___ Test Sediment ___ Test Both
Multi-Phase Sample
___ Test One (which) ___ Test Separately ___ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results: No
Provide Preliminary Fax: Yes

Comments
NOTE:

[1]=Sample Number Prefix:2708-981214-

(*) PRODUCT TO BE RECOVERED FROM PROPOSED MW-6 IRAP.

Lab ID	Sample # [1]	Date	Time	Sample Description	Soil	Water	Other	Number of Containers	PAHs - (EPA 8270 SIM)	Reactive Cyanide/Sulfide (EPA 9010/9030B)	BTEX (EPA 8021)	8 RCRA Metals (EPA 6010/7000A)	Specific Gravity	Viscosity	Ignitability by Flash Point	BTU Content	Corrosivity (pH)	Fuel Fingerprint with narrative			RUSH	Remarks
(*)	MW-6-32-01	14-Dec-98	9:48	oil product : MW-6-32			X	2	X	X	X	X	X	X	X	X	X	X				Normal Turn
	MW-10-25-02	14-Dec-98	10:45	oil product MW-10-25			X	2	X	X	X	X	X	X	X	X	X	X				Normal Turn
	MW-11-32-03	14-Dec-98	14:20	oil product ~~MW-10-25~~ MW-11-32			X	1	X		X		X	X		X		X				

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAI	12-15-98	0935	[signature]	NCA
[signature]	NCA	12-15-98	1015	Sara Mc Clurg	NCA

SCOEPA00011186

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RECEIVED MAY 10

Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
2708-981214-MW-6-32-01	P812258-01	Oil Product	12/14/98
2708-981214-MW-10-25-02	P812258-02	Oil Product	12/14/98
2708-981214-MW-11-32-03	P812258-03	Oil Product	12/14/98

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434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Hydrocarbon Identification (Qualitative) per EPA Method 8015 (modified)
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
2708-981214-MW-6-32-01			P812258-01				Oil Product	1
Gasoline Range Hydrocarbons	1280414	12/17/98	12/17/98		20.0	DET	mg/kg	
Diesel Range Hydrocarbons	"	"	"		50.0	DET	"	
Heavy Oil Range Hydrocarbons	"	"	"		100	DET	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	*%*	*2*
2708-981214-MW-10-25-02			P812258-02				Oil Product	1
Gasoline Range Hydrocarbons	1280414	12/17/98	12/17/98		100	DET	mg/kg	
Diesel Range Hydrocarbons	"	"	"		250	DET	"	
Heavy Oil Range Hydrocarbons	"	"	"		500	DET	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	*%*	*2*
2708-981214-MW-11-32-03			P812258-03				Oil Product	1
Gasoline Range Hydrocarbons	1280414	12/17/98	12/17/98		100	DET	mg/kg	
Diesel Range Hydrocarbons	"	"	"		250	DET	"	
Heavy Oil Range Hydrocarbons	"	"	"		500	DET	"	
Surrogate: 1-Chlorooctadecane	"	"	"	*50.0-150*		*NR*	*%*	*2*

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

BTEX per EPA Method 8020A
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
2708-981214-MW-6-32-01			P812258-01				Oil Product	
Benzene	1280546	12/17/98	12/23/98		5.00	589	mg/kg	
Toluene	"	"	"		5.00	ND	"	
Ethylbenzene	"	"	"		5.00	2220	"	
Xylenes (total)	"	"	"		5.00	1240	"	
Surrogate: a,a,a-TFT	"	"	"	*50.0-150*		*NR*	*%*	*2*
2708-981214-MW-10-25-02			P812258-02				Oil Product	
Benzene	1280546	12/17/98	12/28/98		25.0	14400	mg/kg	
Toluene	"	"	"		25.0	21900	"	
Ethylbenzene	"	"	"		25.0	5320	"	
Xylenes (total)	"	"	"		25.0	19500	"	
Surrogate: a,a,a-TFT	"	"	"	*50.0-150*		*NR*	*%*	*2*
2708-981214-MW-11-32-03			P812258-03				Oil Product	
Benzene	1280546	12/17/98	12/23/98		5.00	2740	mg/kg	
Toluene	"	"	"		5.00	2950	"	
Ethylbenzene	"	"	"		5.00	1760	"	
Xylenes (total)	"	"	"		5.00	4400	"	
Surrogate: a,a,a-TFT	"	"	"	*50.0-150*		*NR*	*%*	*2*

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Total Metals per EPA 6000/7000 Series Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
2708-981214-MW-6-32-01			P812258-01				Oil Product	
Barium	1280541	12/18/98	12/22/98	EPA 6010A	0.500	ND	mg/kg	
Cadmium	"	"	"	EPA 6010A	0.500	ND	"	
Chromium	"	"	"	EPA 6010A	0.500	**0.700**	"	
Lead	"	"	"	EPA 6010A	10.0	ND	"	
Silver	"	"	"	EPA 6010A	0.500	ND	"	
Arsenic	"	"	12/28/98	EPA 6020	0.500	**2.75**	"	
Selenium	"	"	"	EPA 6020	0.500	**0.550**	"	
Mercury	1280401	12/16/98	12/16/98	EPA 7471A	0.0500	**0.0590**	"	
2708-981214-MW-10-25-02			P812258-02				Oil Product	
Barium	1280541	12/18/98	12/22/98	EPA 6010A	0.500	**0.700**	mg/kg	
Cadmium	"	"	"	EPA 6010A	0.500	ND	"	
Chromium	"	"	"	EPA 6010A	0.500	**0.850**	"	
Lead	"	"	"	EPA 6010A	10.0	ND	"	
Silver	"	"	"	EPA 6010A	0.500	ND	"	
Arsenic	"	"	12/28/98	EPA 6020	0.500	**3.85**	"	
Selenium	"	"	"	EPA 6020	0.500	ND	"	
Mercury	1280401	12/16/98	12/16/98	EPA 7471A	0.0500	ND	"	

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lahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
34 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
708-981214-MW-6-32-01 (*)			P812258-01				Oil Product	
cenaphthene	1280594	12/28/98	1/13/99		2010	25800	mg/kg	
Acenaphthylene	"	"	"		2010	ND	"	
nthracene	"	"	"		2010	16200	"	
enzo (a) anthracene	"	"	"		2010	4030	"	
Benzo (a) pyrene	"	"	"		2010	ND	"	
Benzo (b) fluoranthene	"	"	"		2010	ND	"	
enzo (ghi) perylene	"	"	"		2010	ND	"	
enzo (k) fluoranthene	"	"	"		2010	ND	"	
Chrysene	"	"	"		2010	5270	"	
ibenzo (a,h) anthracene	"	"	"		2010	ND	"	
luoranthene	"	"	"		2010	25700	"	
Fluorene	"	"	"		2010	13000	"	
deno (1,2,3-cd) pyrene	"	"	"		2010	ND	"	
aphthalene	"	"	"		2010	31300	"	
Phenanthrene	"	"	"		2010	67100	"	
Pyrene	"	"	"		2010	26500	"	
urrogate: 2-Fluorobiphenyl	"	"	"	*48.0-138*		*NR*	*%*	*2*
urrogate: p-Terphenyl-d14	"	"	"	*50.0-132*		*NR*	"	*2*
urrogate: Nitrobenzene-d5	"	"	"	*58.0-143*		*NR*	"	*2*
08-981214-MW-10-25-02			P812258-02				Oil Product	
cenaphthene	1280594	12/28/98	1/13/99		2010	14500	mg/kg	
cenaphthylene	"	"	"		2010	4940	"	
thracene	"	"	"		2010	10300	"	
enzo (a) anthracene	"	"	"		2010	4890	"	
enzo (a) pyrene	"	"	"		2010	4000	"	
nzo (b) fluoranthene	"	"	"		2010	2040	"	
nzo (ghi) perylene	"	"	"		2010	2370	"	
enzo (k) fluoranthene	"	"	"		2010	2330	"	
rysene	"	"	"		2010	6230	"	
benzo (a,h) anthracene	"	"	"		2010	ND	"	
luoranthene	"	"	"		2010	27200	"	
luorene	"	"	"		2010	12100	"	
deno (1,2,3-cd) pyrene	"	"	"		2010	ND	"	
aphthalene	"	"	"		2010	13300	"	
henanthrene	"	"	"		2010	58200	"	
rene	"	"	"		2010	27300	"	
rogate: 2-Fluorobiphenyl	"	"	"	*48.0-138*		*NR*	*%*	*2*

rth Creek Analytical - Portland

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

lip Nerenberg, Laboratory Manager

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
2708-981214-MW-10-25-02 (continued)			P812258-02				Oil Product	
Surrogate: p-Terphenyl-d14	*1280594*	*12/28/98*	*1/13/99*	*50.0-132*		*NR*	*%*	*2*
Surrogate: Nitrobenzene-d5	*"*	*"*	*"*	*58.0-143*		*NR*	*"*	*2*
2708-981214-MW-11-32-03			P812258-03				Oil Product	
Acenaphthene	1280594	12/28/98	1/13/99		2010	9140	mg/kg	
Acenaphthylene	"	"	"		2010	7480	"	
Anthracene	"	"	"		2010	9810	"	
Benzo (a) anthracene	"	"	"		2010	4060	"	
Benzo (a) pyrene	"	"	"		2010	3920	"	
Benzo (b) fluoranthene	"	"	"		2010	ND	"	
Benzo (ghi) perylene	"	"	"		2010	2630	"	
Benzo (k) fluoranthene	"	"	"		2010	2790	"	
Chrysene	"	"	"		2010	5440	"	
Dibenzo (a,h) anthracene	"	"	"		2010	ND	"	
Fluoranthene	"	"	"		2010	25000	"	
Fluorene	"	"	"		2010	10100	"	
Indeno (1,2,3-cd) pyrene	"	"	"		2010	ND	"	
Naphthalene	"	"	"		2010	13400	"	
Phenanthrene	"	"	"		2010	45900	"	
Pyrene	"	"	"		2010	24800	"	
Surrogate: 2-Fluorobiphenyl	*"*	*"*	*"*	*48.0-138*		*NR*	*%*	*2*
Surrogate: p-Terphenyl-d14	*"*	*"*	*"*	*50.0-132*		*NR*	*"*	*2*
Surrogate: Nitrobenzene-d5	*"*	*"*	*"*	*58.0-143*		*NR*	*"*	*2*

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lahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
34 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Conventional Chemistry Parameters per APHA/EPA Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
708-981214-MW-6-32-01			P812258-01				Oil Product	
H	1280406	12/16/98	12/16/98	EPA 150.1/9040A		6.26	pH Units	
708-981214-MW-10-25-02			P812258-02				Oil Product	
H	1280406	12/16/98	12/16/98	EPA 150.1/9040A		4.30	pH Units	

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Physical Parameters per APHA/ASTM/EPA Methods
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
2708-981214-MW-6-32-01			P812258-01				Oil Product	
No Flash to	1280307	1/5/99	1/5/99	EPA 1010	150	ND	°F	
2708-981214-MW-10-25-02			P812258-02				Oil Product	
Flashpoint	1280307	1/5/99	1/5/99	EPA 1010	150	94.0	°F	

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Reactive Cyanide and Sulfide as Total CN and Total S2
North Creek Analytical - Portland

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
2708-981214-MW-6-32-01			P812258-01				Oil Product	
Reactive Cyanide	1280557	12/23/98	12/23/98	EPA 9010A	0.200	ND	mg/kg	
Reactive Sulfide	1280584	12/28/98	12/28/98	EPA 9030	50.0	434	mg/kg	3
2708-981214-MW-10-25-02			P812258-02				Oil Product	
Reactive Cyanide	1280557	12/23/98	12/23/98	EPA 9010A	0.200	ND	mg/kg	
Reactive Sulfide	1280584	12/28/98	12/28/98	EPA 9030	50.0	ND	mg/kg	

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434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Hydrocarbon Identification (Qualitative) per EPA Method 8015 (modified)/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280414	**Date Prepared: 12/16/98**				**Extraction Method: TPH-HCID (OR)**					
Blank	**1280414-BLK1**									
Gasoline Range Hydrocarbons	12/16/98			ND	mg/kg	20.0				
Diesel Range Hydrocarbons	"			ND	"	50.0				
Heavy Oil Range Hydrocarbons	"			ND	"	100				
Surrogate: 1-Chlorooctadecane	"	*DET*		*DET*	"	*50.0-150*	*93.0*			
Blank	**1280414-BLK2**									
Gasoline Range Hydrocarbons	12/17/98			ND	mg/kg	20.0				
Diesel Range Hydrocarbons	"			ND	"	50.0				
Heavy Oil Range Hydrocarbons	"			ND	"	100				
Surrogate: 1-Chlorooctadecane	"	*DET*		*DET*	"	*50.0-150*	*94.0*			

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

BTEX per EPA Method 8020A/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280546	**Date Prepared: 12/22/98**				**Extraction Method: EPA 5030**					
Blank	**1280546-BLK1**									
Benzene	12/23/98			ND	mg/kg	0.0500				
Toluene	"			ND	"	0.0500				
Ethylbenzene	"			ND	"	0.0500				
Xylenes (total)	"			ND	"	0.0500				
Surrogate: a,a,a-TFT	"	*2.50*		*2.37*	"	*50.0-150*	*94.8*			
LCS	**1280546-BS2**									
Benzene	12/23/98	0.500		0.375	mg/kg	69.0-138	75.0			
Toluene	"	0.500		0.430	"	53.0-151	86.0			
Ethylbenzene	"	0.500		0.455	"	61.0-141	91.0			
Xylenes (total)	"	1.50		1.44	"	62.0-144	96.0			
Surrogate: a,a,a-TFT	"	*2.50*		*2.31*	"	*50.0-150*	*92.4*			
Matrix Spike	**1280546-MS1**		**P812357-03**							
Benzene	12/23/98	0.500	ND	0.246	mg/kg	56.0-123	**49.2**			4
Toluene	"	0.500	ND	0.265	"	54.0-123	**53.0**			4
Ethylbenzene	"	0.500	ND	0.275	"	45.0-130	**55.0**			
Xylenes (total)	"	1.50	ND	0.867	"	50.0-127	**57.8**			
Surrogate: a,a,a-TFT	"	*2.50*		*1.90*	"	*50.0-150*	*76.0*			
Matrix Spike Dup	**1280546-MSD1**		**P812357-03**							
Benzene	12/23/98	0.500	ND	0.238	mg/kg	56.0-123	**47.6**	17.0	**3.31**	4
Toluene	"	0.500	ND	0.268	"	54.0-123	**53.6**	24.0	**1.13**	4
Ethylbenzene	"	0.500	ND	0.288	"	45.0-130	**57.6**	20.0	**4.62**	
Xylenes (total)	"	1.50	ND	0.915	"	50.0-127	**61.0**	20.0	**5.39**	
Surrogate: a,a,a-TFT	"	*2.50*		*1.84*	"	*50.0-150*	*73.6*			

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280401	**Date Prepared: 12/16/98**				**Extraction Method: EPA 7471**					
Blank	**1280401-BLK1**									
Mercury	12/16/98			ND	mg/kg	0.0500				
LCS	**1280401-BS1**									
Mercury	12/16/98	0.500		0.520	mg/kg	80.0-120	104			
Duplicate	**1280401-DUP1**		**P812107-01**							
Mercury	12/16/98		0.350	0.340	mg/kg			40.0	2.90	
Matrix Spike	**1280401-MS1**		**P812107-01**							
Mercury	12/16/98	0.500	0.350	0.820	mg/kg	75.0-125	94.0			
Matrix Spike	**1280401-MS2**		**P812221-04**							
Mercury	12/16/98	0.500	ND	0.480	mg/kg	75.0-125	96.0			
Batch: 1280541	**Date Prepared: 12/18/98**				**Extraction Method: EPA 3050**					
Blank	**1280541-BLK1**									
Barium	12/22/98			ND	mg/kg	0.500				
Cadmium	12/21/98			ND	"	0.500				
Chromium	"			ND	"	0.500				
Lead	"			ND	"	10.0				
Silver	12/22/98			ND	"	0.500				
Arsenic	12/28/98			ND	"	0.500				
Selenium	"			ND	"	0.500				
LCS	**1280541-BS1**									
Barium	12/22/98	25.0		23.9	mg/kg	80.0-120	95.6			
Cadmium	12/21/98	10.0		8.10	"	80.0-120	81.0			
Chromium	"	25.0		22.0	"	80.0-120	88.0			
Lead	"	50.0		41.6	"	80.0-120	83.2			
Silver	12/22/98	5.00		5.35	"	80.0-120	107			
Arsenic	12/28/98	50.0		51.0	"	80.0-120	102			
Selenium	"	50.0		49.9	"	80.0-120	99.8			
Duplicate	**1280541-DUP1**		**P812174-01**							
Barium	12/22/98		0.850	0.850	mg/kg			20.0	0	
Cadmium	12/21/98		1.95	1.85	"			20.0	5.26	
Chromium	"		ND	ND	"			20.0		

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ahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
34 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
ortland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Total Metals per EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
uplicate (continued)	**1280541-DUP1**		**P812174-01**							
ead	12/21/98		21.6	22.9	mg/kg			20.0	5.84	
ilver	12/22/98		ND	ND	"			20.0		
rsenic	12/28/98		ND	ND	"			20.0		
elenium	"		ND	ND	"			20.0		
atrix Spike	**1280541-MS1**		**P812174-01**							
arium	12/22/98	25.0	0.850	25.8	mg/kg	75.0-125	99.8			
admium	"	10.0	1.95	11.2	"	75.0-125	92.5			
hromium	"	25.0	ND	28.0	"	75.0-125	112			
ead	"	50.0	21.6	68.0	"	75.0-125	92.8			
ilver	"	5.00	ND	NR	"	75.0-125	NR			5
rsenic	12/28/98	50.0	ND	48.7	"	75.0-125	97.4			
elenium	"	50.0	ND	52.0	"	75.0-125	104			

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Polynuclear Aromatic Compounds per EPA 8270M-SIM/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280594	**Date Prepared: 12/28/98**				**Extraction Method: EPA 3580**					
Blank	**1280594-BLK1**									
Acenaphthene	1/13/99			ND	mg/kg	2010				
Acenaphthylene	"			ND	"	2010				
Anthracene	"			ND	"	2010				
Benzo (a) anthracene	"			ND	"	2010				
Benzo (a) pyrene	"			ND	"	2010				
Benzo (b) fluoranthene	"			ND	"	2010				
Benzo (ghi) perylene	"			ND	"	2010				
Benzo (k) fluoranthene	"			ND	"	2010				
Chrysene	"			ND	"	2010				
Dibenzo (a,h) anthracene	"			ND	"	2010				
Fluoranthene	"			ND	"	2010				
Fluorene	"			ND	"	2010				
Indeno (1,2,3-cd) pyrene	"			ND	"	2010				
Naphthalene	"			ND	"	2010				
Phenanthrene	"			ND	"	2010				
Pyrene	"			ND	"	2010				
Surrogate: 2-Fluorobiphenyl	"	*25000*		*40500*	"	*48.0-138*	*162*			*4*
Surrogate: p-Terphenyl-d14	"	*25000*		*30400*	"	*50.0-132*	*122*			
Surrogate: Nitrobenzene-d5	"	*25000*		*37600*	"	*58.0-143*	*150*			*4*
LCS	**1280594-BS1**									
Acenaphthene	1/13/99	50000		62700	mg/kg	50.0-150	125			
Benzo (a) pyrene	"	50000		45700	"	50.0-150	91.4			
Pyrene	"	50000		64000	"	50.0-150	128			
Surrogate: 2-Fluorobiphenyl	"	*25000*		*38700*	"	*48.0-138*	*155*			*4*
Surrogate: p-Terphenyl-d14	"	*25000*		*33200*	"	*50.0-132*	*133*			*4*
Surrogate: Nitrobenzene-d5	"	*25000*		*28400*	"	*58.0-143*	*114*			
Duplicate	**1280594-DUP1**		**P812258-01**							
Acenaphthene	1/13/99		25800	24400	mg/kg			50.0	**5.58**	
Acenaphthylene	"		ND	ND	"			50.0		
Anthracene	"		16200	14700	"			50.0	**9.71**	
Benzo (a) anthracene	"		4030	3440	"			50.0	**15.8**	
Benzo (a) pyrene	"		ND	ND	"			50.0		
Benzo (b) fluoranthene	"		ND	ND	"			50.0		
Benzo (ghi) perylene	"		ND	ND	"			50.0		
Benzo (k) fluoranthene	"		ND	ND	"			50.0		

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Polynuclear Aromatic Compounds per EPA 8270M-SIM/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Duplicate (continued)	**1280594-DUP1**		**P812258-01**							
Chrysene	1/13/99		5270	4770	mg/kg			50.0	**9.96**	
Dibenzo (a,h) anthracene	"		ND	ND	"			50.0		
Fluoranthene	"		25700	24100	"			50.0	**6.43**	
Fluorene	"		13000	12300	"			50.0	**5.53**	
Indeno (1,2,3-cd) pyrene	"		ND	ND	"			50.0		
Naphthalene	"		31300	29700	"			50.0	**5.25**	
Phenanthrene	"		67100	62600	"			50.0	**6.94**	
Pyrene	"		26500	24400	"			50.0	**8.25**	
Surrogate: 2-Fluorobiphenyl	"	*25000*		*ND*	"	*48.0-138*	*NR*			*2*
Surrogate: p-Terphenyl-d14	"	*25000*		*ND*	"	*50.0-132*	*NR*			*2*
Surrogate: Nitrobenzene-d5	"	*25000*		*ND*	"	*58.0-143*	*NR*			*2*

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34 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Conventional Chemistry Parameters per APHA/EPA Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
atch: 1280406	Date Prepared: 12/16/98				Extraction Method: Wet Chem					
Duplicate	1280406-DUP1	P812266-01								
pH	12/16/98		7.30	7.29	pH Units				0.137	

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503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Physical Parameters per APHA/ASTM/EPA Methods/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280307	Date Prepared: 12/11/98				Extraction Method: EPA 1010					
Duplicate	1280307-DUP1	P812059-05								
No Flash to	12/11/98		ND	ND	°F	150		50.0	0	

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509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
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Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
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Reactive Cyanide and Sulfide as Total CN and Total S2/Quality Control
North Creek Analytical - Portland

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 1280557	**Date Prepared: 12/23/98**				**Extraction Method: Wet Chem**					
Blank	**1280557-BLK1**									
Reactive Cyanide	12/23/98			ND	mg/kg	0.100				
LCS	**1280557-BS1**									
Reactive Cyanide	12/23/98	0.200		0.183	mg/kg	75.0-125	91.5			
LCS	**1280557-BS2**									
Reactive Cyanide	12/23/98	0.200		0.179	mg/kg	75.0-125	89.5			
Duplicate	**1280557-DUP1**		**P812258-01**							
Reactive Cyanide	12/23/98		ND	ND	mg/kg			20.0		
Duplicate	**1280557-DUP2**		**P812258-02**							
Reactive Cyanide	12/23/98		ND	ND	mg/kg			20.0		
Matrix Spike	**1280557-MS1**		**P812258-01**							
Reactive Cyanide	12/23/98	19.8	ND	17.4	mg/kg	75.0-125	87.9			
Matrix Spike Dup	**1280557-MSD1**		**P812258-01**							
Reactive Cyanide	12/23/98	14.7	ND	13.0	mg/kg	75.0-125	88.4	20.0	0.567	
Batch: 1280584	**Date Prepared: 12/28/98**				**Extraction Method: Wet Chem**					
Blank	**1280584-BLK1**									
Reactive Sulfide	12/28/98			ND	mg/kg	50				
LCS	**1280584-BS1**									
Reactive Sulfide	12/28/98	1050		1060	mg/kg	75.0-125	101			
Duplicate	**1280584-DUP1**		**P812258-01**							
Reactive Sulfide	12/28/98		434	ND	mg/kg			40.0		6
Matrix Spike	**1280584-MS1**		**P812258-01**							
Reactive Sulfide	12/28/98	4050	434	4450	mg/kg	75.0-125	99.2			

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Hahn and Associates, Inc.	Project:	NWNG Gasco Site	Sampled:	12/14/98
434 NW Sixth Ave., Suite 203	Project Number:	2708-50	Received:	12/15/98
Portland, OR 97209	Project Manager:	Rob Ede	Reported:	4/16/99 01:09

Notes and Definitions

#	Note
	Detected hydrocarbons have pattern and range consistent with creosotes.
2	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
3	This sample does not contain levels of reactive sulfide that are characteristic of a reactive waste as defined by 40CFR 261.23
	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
	Recovery is typical of oily matrix sample preparation necessary for analysis.
5	Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Portland

Philip Nerenberg, Laboratory Manager

BRAUN℠
INTERTEC

Braun Intertec Corporation
6032 N. Cutter Circle, Ste. 480
P.O. Box 17126
Portland, Oregon 97217
503-289-1778 Fax: 289-1918

Engineers and Scientists Serving the Built and Natural Environments

January 19, 1999

Project No. EAGX-98-0010
Report No. 08-98-0599

Philip Nerenberg
North Creek Analytical
9405 SW Nimbus Ave.
Beaverton, OR 97008

Dear Mr. Nerenberg:

Re: Analysis performed on three (3) tar samples received December 17, 1998, pursuant to subcontract order number P812258 dated December 15, 1998.

Method: Heating Value by ASTM D2015
Specific Gravity by SM 2710F

Analyte	P812258-01	P812258-02	P812258-03
Heating Value, BTU/lb	9230.	12,230.	12,280.
Specific Gravity, $_{T/4oC}$	1.05	1.05	1.09

SFS Viscosity analysis was requested for these samples; however, the samples formed small "tarry" balls when heated that plugged up the viscosity tubes. The tubes were heated to over 100°C to no avail. It took nearly two hours to unclog the instrument. Solvents including MEK, Methylene Chloride, Freon, Acetone, and Isopropyl Alcohol were unsuccessful in cleaning the glassware and the glassware was subsequently discarded. We regretfully will not be able to perform the viscosity on these samples.

Thank you for choosing Braun Intertec Corporation as your analytical laboratory. We look forward to working with you again. If you have any questions or concerns, please feel free to call me at 503-978-4743.

Sincerely,

Laura Hladky
Chemist

Wendy Campbell
Lead Chemist

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

September 20, 2002

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: Wacker Siltronic Corporation
Final Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At Wacker's request, MFA has prepared this work plan to further assess detections of TCE in the northern corner of the site. The scope of work described in the work plan will allow for more informed interpretations to be made regarding the source, nature, and extent of TCE detected in this portion of the site. The Department provided comments to the Work Plan in a letter dated September 6, 2002. On September 17, Wacker, DEQ, and MFA discussed the Department's September 6 letter via telephone. The work plan has been revised to reflect agreements made between Wacker and DEQ during the September 17 conference call. An overview of the site background and a description of the most recently collected TCE data are provided in the next section of the work plan.

BACKGROUND

TCE has been detected in groundwater based on data collected by Hahn & Associates, Inc. (HAI) in August 2001[1] and by Limno-Tech, Inc. (LTI) in March 2002.[2] Field work conducted by HAI was done on behalf of Northwest Natural (NW Natural), and included exploratory drilling and soil and reconnaissance groundwater sampling at ten locations, designated P-1 through P-10, and the drilling and installation of three monitoring wells,

[1] Hahn & Associates, Inc., 2001. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Northwest Natural. November 20.

[2] Limno-Tech, Inc., 2002. *Summary of the Remedial Investigation Activities from the Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Wacker Siltronic Corporation. April 30.

L:\Projects\8128.01\03\Wpf1-FcsdP2Smpl.doc-w00:dsb

named WS-8-33, WS-8-59, and WS-9-34 (see Figure 1). TCE was detected in a groundwater sample collected from one of the exploratory borings (P-2, see Figure 1) at a concentration of 11,200 micrograms per liter (ug/L or parts per billion).

On behalf of Wacker, LTI performed followup work to assess the TCE detected by HAI. This included further evaluating two releases of wastewater with TCE that occurred in the immediate vicinity of Wacker's wastewater treatment system in December 1984 (see Figure 1). Shortly after the releases occurred, Wacker implemented a series of removal actions to excavate material potentially impacted by the release. Over 150 cubic yards of material was excavated during the course of the removal action(s). Analysis of confirmatory samples indicated that the removal work succeeded in removing TCE to concentrations of less than 1 milligram per kilogram (mg/kg or parts per million).

LTI's field program included drilling three exploratory borings, designated GP02-01, GP02-02, and GP02-03 (see Figure 1), and collecting soil and reconnaissance groundwater samples for analysis. The three exploratory borings were located within (GP02-01), west (GP02-02), and north-northwest (GP02-03) of the 1984 wastewater release area.

Review of data contained in LTI's April 2002 data package indicates the following:

- TCE was not detected in soil and/or groundwater samples collected from GP02-01 to the depth of drilling (i.e., 100 feet below ground surface [bgs]) at laboratory reporting limits of between 0.005 mg/kg and 1 mg/kg for soil, and 1 ug/L for groundwater.

- TCE was detected in soil and groundwater samples collected from GP02-02. The chemical was detected in soil at a maximum concentration of 1.97 mg/kg. TCE was detected in groundwater samples collected at depth intervals of 56 to 60 feet bgs and 96 to 100 feet bgs in concentrations of 21,000 ug/L and 575,000 ug/L, respectively.

- TCE was not detected at or above the reporting limit of 0.005 mg/kg in soil samples collected from GP02-03. TCE was detected in groundwater samples collected at depth intervals of 31 to 35 feet bgs (4.29 ug/L) and 56 to 60 feet bgs (33.4 ug/L).

The results of HAI's and LTI's work were reported to the DEQ in November 2001 and April 2002 respectively. In the May 31 letter to Wacker, the Department provided a list of

recommendations for additional work to further evaluate the source and extent of the TCE detections, including:

1. Reviewing Wacker's files and facility construction records to identify potential sources of TCE.

2. Drilling to characterize the stratigraphy beneath the site.

3. Collecting and analyzing soil and groundwater samples from "identified source areas."

4. Evaluation of a source of dense nonaqueous-phase liquids in the subsurface.

5. Installation of monitoring wells near exploratory boring GP02-02, in the area of the 1984 wastewater release, and in the vicinity of boring P-2 to assess the lateral and vertical extent of contamination between the release and the Willamette River.

In response to DEQ's May 31 letter, Wacker requested that MFA develop a general approach for further assessing TCE detections in the northern portion of the site. During a meeting on August 1, the general approach was presented to, and agreed upon by, the Department. The DEQ agreed-upon approach consists of two components. The first component is a site background review to compile historical information regarding Wacker's TCE use at the site. The second component includes a focused soil and groundwater sampling program in the northern corner of Wacker's property.

This work plan (the Work Plan) has been prepared to provide the DEQ with the scope of work for conducting the focused soil and groundwater sampling work in the northern corner of the site. Field work will be performed consistent with applicable portions of HAI's remedial investigation work plan[3] and LTI's supplemental remedial investigation work plan.[4] The scope of work includes descriptions of the drilling procedures, soil and groundwater sampling methods, and the laboratory analytical program for the work.

---

[3] Hahn & Associates, Inc. 2001. *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1. A work plan submitted to DEQ on behalf of Northwest Natural.

[4] Limno-Tech, Inc. 2002. *Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.* March 6. A work plan submitted to the DEQ on behalf of Wacker.

SCOPE OF WORK

The focused exploratory drilling and soil and groundwater sampling work will be conducted in the northern corner of the Wacker site in the vicinity of boring P-2 (see Figure 2). The objective of the focused sampling program is to assess potential local source area(s) of TCE in the vicinity of boring P-2, and further evaluate the lateral and vertical distribution of the chemical in this portion of the site. The data generated by analyzing soil and groundwater samples collected during the drilling and sampling program will be used in conjunction with the site background review to develop recommendations for conducting additional field investigations of potential TCE source areas, as appropriate. The scope of work is organized into three tasks. Each task is further described below.

Task 1—Project Coordination

Drilling and sampling activities will be scheduled as soon as practicable after the Work Plan is approved by the DEQ. The Department will be provided a minimum notice of one week before field work is initiated. The DEQ will also be verbally notified upon initiation and completion of field drilling and sampling work.

Task 2—Focused Assessment of TCE Detections in the Northern Corner of the Property

Exploratory drilling and soil and groundwater sampling will be performed using methods similar to those used previously. Four temporary borings will be drilled in the vicinity of boring P-2 using Geoprobe™ drilling and sampling equipment (see Figure 2). The borings will be positioned to collect additional soil and groundwater data between P-2 and the northwest property line, between P-2 and boring P-3, between P-2 and boring GP02-03, and between P-2 and the north end of the Fab 1 Building.

The temporary borings will be decommissioned after drilling and sampling work is completed at each location. All of the borings will be drilled, sampled, and decommissioned according to applicable Oregon regulations.[5] The procedures that will be used in the field to conduct exploratory drilling and collect and analyze soil and groundwater samples are described below.

---

[5] Oregon Water Resources Division. 1995. *Administrative Rules for Construction, Maintenance, and Abandonment of Monitoring Wells and Other Holes in Oregon.*

Exploratory Drilling

The locations of the four Geoprobe™ borings, designated GP-4 through GP-7, are shown on Figure 2. Geo-Tech Explorations, Inc. of Tualatin, Oregon (Oregon Monitoring Well Constructor License No. 1011), will provide the Geoprobe™ drilling equipment for this project.

Each of the four Geoprobe™ borings will be advanced to a projected depth of approximately 100 feet bgs. Based on observations made during the drilling of boring P-2 (see Figure 2), subsurface geologic material generally consists of unconsolidated sand with gravel from near land surface to 32.5 feet bgs (upper sand with gravel); intermediate depth mixtures of silt, sandy silt, silty sand, and fine sand to 53.5 feet bgs (intermediate depth material); and deeper fine sand to the bottom of the borehole at approximately 100 bgs. The depth of shallow groundwater in the uppermost saturated material was observed at a depth approximately 28 feet bgs during drilling. In addition, observations made during the drilling of boring P-1 (see Figure 2) indicate that subsurface material becomes "black and tarry" between 29 feet and 31 feet bgs.

Given the information summarized above, MFA recommends that dual-tube Geoprobe™ drilling equipment be used for this project. Borings will be advanced from land surface into finer-grained intermediate depth material observed between 30 feet and 35 feet bgs. Within this depth range a bentonite slurry seal will be placed in the borehole. The bentonite seal will be a minimum of 5 feet in length. The bentonite seal will be placed to reduce the potential for contamination, if any, encountered at shallow depth intervals to migrate vertically downward and cross-contaminate deeper sampling intervals.

Prior to initiating drilling at the site, the drilling equipment and all downhole sampling equipment will be cleaned using a high-pressure hot-water washer.

Soil Sample Collection

Soil samples will be collected during drilling for visual observation and lithologic classification to the bottom depth of each boring. Soil will be collected continuously, or as site conditions allow, using a 5-foot-long Macro Core™ sampler designed for use with either 2.125-inch outside diameter (o.d.) or 3.25-inch o.d. drill rods. Following retrieval, soil will be described in the field by an MFA geologist working under the direct supervision of a geologist registered in the state of Oregon. Soil will be described using American Society for Testing and Materials (ASTM) Designation D2488-84, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*. Boring

logs will be prepared for each of the four borings. Boring logs will include the project name and location, name of the drilling contractor, drilling method, sampling method, sample depths, and descriptions of the soils observed in the samples.

Depth discrete samples of soil will be selected for analysis from up to three depth intervals within the unsaturated zone. Soil samples will be retained using the criteria described by LTI except that the two upper soil samples will be selected for analysis based on measurements made in the field using a photoionization detector (PID) or a flame-ionization detector (FID). The third, and deepest, soil sample will be collected from just above the uppermost saturated material observed during drilling at each location (projected between 25 feet and 30 feet bgs).

The two upper soil samples will be selected for analysis based on measurements made in the field using the PID or FID. After subsurface material is retrieved from the unsaturated zone, a PID or an FID will be used to screen each core. Field measurements will be taken at intervals of 1 foot from small holes made in the soil core. Due to the resiliency of the membrane retaining the soil, the holes will be made using a battery powered drill. The drill bit will be decontaminated prior to use and after measurements are made on each soil core. The 1-foot section in each core exhibiting the highest PID or FID measurement will be selected and retained for possible testing. Immediately after the core has been opened for visual material observation, the selected section of the soil core will be carefully transferred from the sampler to labeled laboratory-supplied clear glass 8-ounce containers and placed on ice in a rigid shipping container. The two samples of unsaturated material from each boring exhibiting the highest PID or FID readings will be designated for analysis.

Samples designated for laboratory analysis will be delivered to Columbia Analytical Services (CAS), Kelso, Washington, for analysis. A custody seal will be placed over the lid of each shipping container and taped in place. Samples will be transported to CAS accompanied by chain-of-custody paperwork.

Soil Sample Analysis

Up to 12 soil samples (three from each boring) will be collected and submitted to CAS for analysis. The samples will be analyzed for volatile organic compounds (VOCs), including TCE, using USEPA Method 8260B, and for polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270, Selective Ion Method (SIM). These two groups of chemicals represent the analytes that have been detected at the most sampling locations at the highest concentrations on the NW Natural and Wacker properties.

Review of data collected previously suggests that high concentrations of certain chemicals detected in soil and/or groundwater (e.g., PAHs) result in elevated laboratory method reporting limits (MRLs) for VOCs, including TCE. As the goal of this project is to further assess TCE concentrations in the vicinity of P-2, the analytical program for this project will attempt to attain lower MRLs than achieved previously. In order to do this, a series of sample dilutions will be analyzed for each soil and groundwater sample submitted to the laboratory. Using USEPA Method 8260B, the samples will be initially screened at a high dilution factor (e.g., 1:50). The initial screen is intended to quantify target analytes present in the highest concentrations. After this analysis is performed, the results will be reviewed and used to determine an appropriate dilution scheme for that sample. Subsequent analyses will be performed on less-diluted samples. Each sample will be analyzed at a dilution that will attain the lowest MRL allowable with respect to method/instrument capabilities and sample analyte concentrations.

Please note that according to CAS, the approach to diluting/analyzing samples described above does not require modifying USEPA Method 8260B. The unmodified analytical method is used to analyze the series of sample dilutions.

Groundwater Sample Collection

Up to three depth discrete groundwater samples will be collected for analysis from each of the four Geoprobe™ borings. Drilling work completed to date suggests that shallow groundwater could occur at the base of the upper unconsolidated sand with gravel between 25 feet and 35 feet bgs. Two groundwater samples will be collected from below the intermediate depth material at depths of between 65 feet and 75 feet bgs and near the bottom of the borehole projected to be about 100 feet bgs. Samples will be collected using a 5-foot long, 1.5-inch o.d. Geoprobe™ water sampler. The sampler will be pushed to the desired depth and pulled back approximately 5 feet, exposing the internal stainless-steel wire-wrapped well point screen.

The volume of the groundwater inside the screen will be calculated and a minimum of one borehole volume will be removed prior to sample collection. New clean dedicated disposable polyethylene tubing will be connected to a vacuum pump. The vacuum pump will be used to purge the water from the well point screen. Water purged from the boring will be collected in a clean 1-quart jar attached inline between the tubing and the vacuum pump. The water in the 1-quart jar will be used to obtain field measurements (i.e., pH, specific conductance, temperature, and dissolved oxygen) with an Orion 1230 water quality meter. The polyethylene tubing will then be removed from the pump and fitted

with a stainless-steel foot-valve. The tubing and valve will be used to collect the individual samples.

Groundwater samples will be collected using conventional methods associated with the Geoprobe™ drilling method. Groundwater will be drawn into the dedicated tubing via the foot-valve attached and using the tubing as an inertia pump. After groundwater is drawn into the tubing, the tubing will be retracted slowly from the rods and coiled. Groundwater will be poured directly from the tubing into the laboratory-supplied containers. Groundwater collected for VOC analysis will be poured into clear glass 40-milliliter vials. To the maximum extent practicable, the tubing will be handled to minimize agitation of the sample. PAH samples will be collected into 1-liter amber glass bottles. Samples retained for cyanide analysis will be collected into 1-liter polyethylene bottles with sodium hydroxide (NaOH) added as a preservative.

Field sampling activities (e.g., well-purging data, equipment used, sample containers, preservatives used) will be recorded at time of sample collection on field sampling data sheets.

After the groundwater samples have been collected, they will be labeled and placed on ice in a rigid shipping container with chain-of-custody paperwork. A custody seal will be placed over the lid of each shipping container, and then covered with packing tape. Samples will be delivered to CAS in Kelso, Washington, for analysis.

Groundwater Sample Analysis

Groundwater samples will be submitted to CAS for analysis of VOCs, PAHs, and cyanide using USEPA Method 8260B, USEPA Method 8270 SIM, and USEPA Method 9010B respectively. Groundwater samples will be analyzed for VOCs using the same analytical approach as described above for soil samples.

Laboratory QA/QC Data Evaluation and Management

Raw data from the field, and from the contract laboratory, will be downloaded into a computerized database (Access) and reviewed for acceptability. Analytical data will be reviewed to assess whether they meet project-specific data quality objectives. Review will be based on accepted USEPA procedures for evaluating data generated from the analysis

of organic chemicals.[6] After completing the data review, a summary report will be prepared to support specific or routine report deliverables.

Task 3—Reporting

The results of the focused soil and groundwater sampling will be incorporated into a report summarizing the work completed at the Wacker site to date. The report will provide an overview of the regulatory status of the site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site. The report will also include tables that provide drilling and construction details for on-site exploratory borings and monitoring wells, historical groundwater elevation measurements, and compilations of analyte detections. Figures will be included that show sampling locations, illustrate subsurface geologic interpretations (i.e., generalized geologic cross-sections), and depict the hydraulic gradient at selected depths beneath the site. Copies of logs of exploratory borings and monitoring wells, compiled soil and groundwater data, and laboratory analytical reports will be attached to the report as supporting documentation.

The data collected from the focused sampling program, previous on-site geologic and hydrogeologic evaluations, and the site background review will form the basis for developing recommendations for assessing potential source areas of TCE impacts in the northern portion of the Wacker site.

SCHEDULE

As discussed during the September 17 conference call, work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site has been scheduled to begin on September 25. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil and groundwater samples on a normal turnaround basis, and depending on the laboratory's backlog, the final laboratory analytical reports should be available for review within 15 to 20 business days of receipt of the samples by the laboratory. Preparation of the data summary report will be initiated upon DEQ's approval of the Work Plan. Based on the timeframe outlined for the

---

[6] USEPA. 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Organics Data Review.* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA 540/94/012. February.

focused sampling program, MFA projects that the site summary report will be submitted to DEQ by the middle of December.

Given the current project start date, Wacker would appreciate receiving written approval to proceed with the scope of work prior to initiating field work.

Please feel free to contact with questions and/or comments about this letter, or if you need additional assistance.

Sincerely,

Maul Foster & Alongi, Inc.

Dana S. Bayuk
Principal Hydrogeologist

Attachments: Figures 1 and 2

cc: Rod Struck, DEQ
Cathryn Young, Wacker
✓ Tom McCue, Wacker
Myron Burr, Wacker
Christopher Reive, Jordan Schrader

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WILAMETTE RIVER

WS8-59
P-2
P-3
P-4
P-5
P-11
P-6
P-7
P-8
P-9
WS8-33
P-1
WS9-34
ADMINISTRATION BUILDING
1984 WASTE WATER RELEASE LOCATION
GP02-03
FAB 1 BUILDING
GP02-02
GP02-01
UTILITIES BUILDING
ACID SOLVENT STORAGE
WAREHOUSE
FACILITIES BUILDING
ELECTRICAL SUBSTATION
FAB 2 BUILDING
UTILITY EASMENT
FAB 1 WASTE WATER TREATMENT PLANT
FAB 2 WASTE WATER TREATMENT PLANT
W-3-81
WS-3
WS-1
WS-2
WS-4
WS-6
WS-7
WS-5
NW ST. HELENS ROAD

LEGEND:
PROPERTY BOUNDARY
EXISTING MONITORING WELL
ABANDONED MONITORING WELL
GEOPROBE (PUSH-PROBE) SAMPLE LOCATION
FORMER LOWLAND PONDED AREA

0 120 240
SCALE IN FEET

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 07/11/02 DWN BY JLN CHK BY DES BY DSB APP BY

Suite B
7223 NE Hazel Dell Ave.
Vancouver, WA 98665
p 360.694.2691
f 360.906.1958

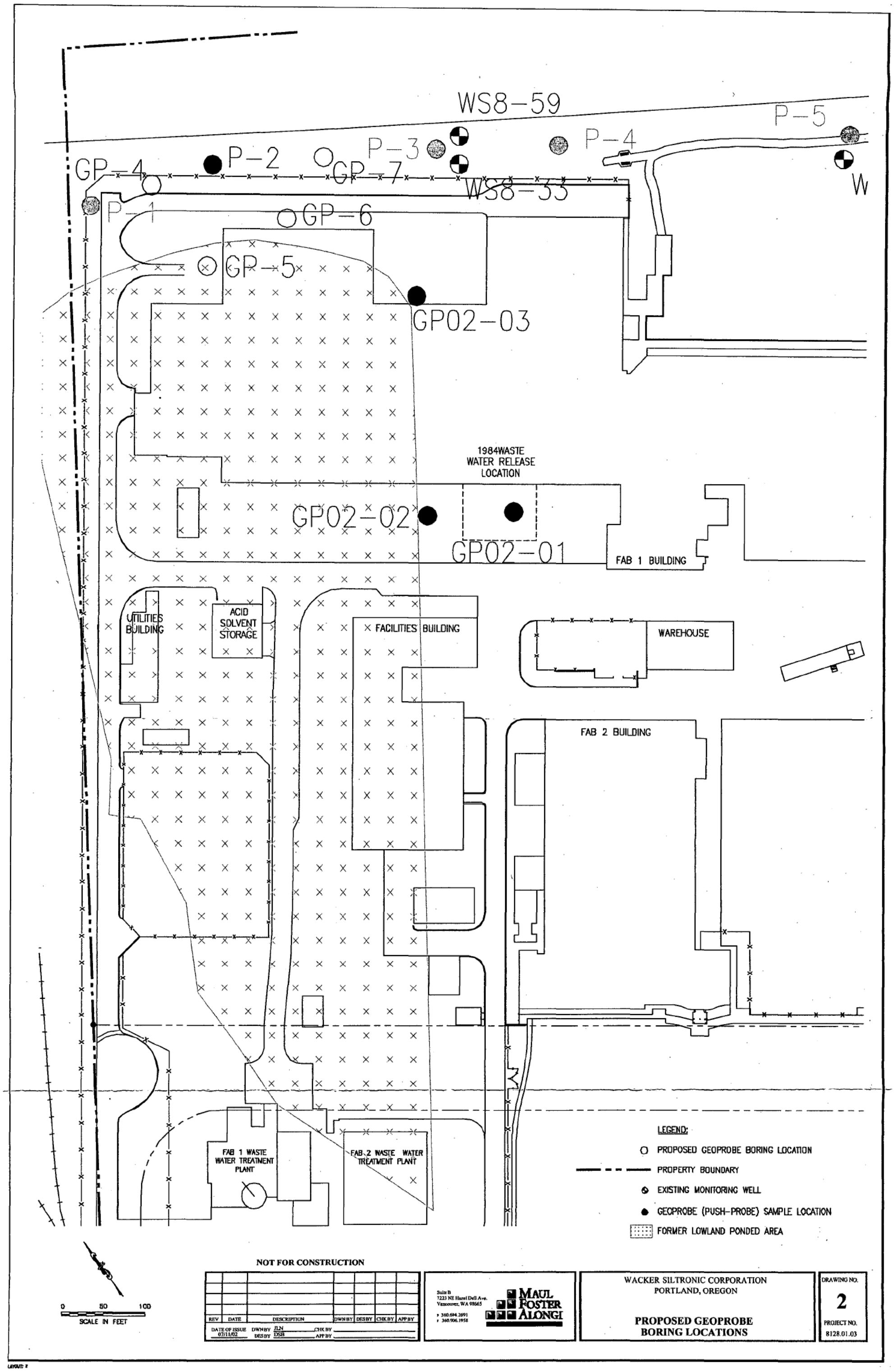
MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

SITE FEATURES

DRAWING NO. 1
PROJECT NO. 8128.01.03

LAYOUT: 1



NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 07/11/02 DWN BY JLN DES BY DSB CHK BY APP BY

Suite B
7223 NE Hazel Dell Ave.
Vancouver, WA 98665
360.694.2691
360.906.1958

MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

PROPOSED GEOPROBE BORING LOCATIONS

DRAWING NO. 2

PROJECT NO. 8128.01.03

LAYOUT: 2

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

September 20, 2002
Project 8128.01.03

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: Wacker Siltronic Corporation—DEQ Comments to the August 16, 2002, *Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210*, prepared by Maul Foster & Alongi, Inc.

Dear Eric:

On behalf of Wacker Siltronic Corporation (Wacker), Maul Foster & Alongi, Inc. (MFA) has prepared this letter responding to the Oregon Department of Environmental Quality (DEQ or Department) comments regarding the above-referenced work plan (the Work Plan). The Work Plan was delivered to DEQ on August 16, 2002, and provides the scope of work to perform exploratory drilling, and soil and reconnaissance groundwater sampling, in the northern corner of the Wacker site. The scope of work presented in the Work Plan focuses on further assessing the horizontal and vertical distribution of trichloroethene (TCE) in the vicinity of exploratory boring P-2.

The Department provided comments to the Work Plan in a letter dated September 6, 2002. On September 17, Wacker, DEQ, and MFA discussed the Department's September 6 letter via telephone. This letter has been prepared based on our understanding of the agreements reached during the September 17 phone discussions and confirms those agreements. The letter is organized into six sections numbered consistent with each of DEQ's review comments. A copy of Department's letter is attached for reference.

GENERAL COMMENTS

Wacker acknowledges that the scope of work described in the Work Plan is focused and does not contain all of the data collection elements listed in the DEQ's May 31, 2002, letter. Subsequent to receiving the May 31 letter, Wacker requested that MFA develop a general approach for further assessing TCE detections in the northern portion of the site.

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During a meeting on August 1, the general approach was presented to, and agreed upon by, the Department. The DEQ agreed-upon approach consists of two components. The first component is a site background review to compile historical information regarding Wacker's TCE use at the site. The second component includes the focused soil and groundwater sampling program in the northern corner of Wacker's property. The scope of work for the focused sampling program is provided in the Work Plan.

As described in the Work Plan, the objective of the focused sampling program is to assess potential local source area(s) of TCE in the northern corner of the site, and further evaluate the lateral and vertical distribution of the chemical in the vicinity of boring P-2. The data generated by analyzing soil and groundwater samples collected during the drilling and sampling program will be used in conjunction with the site background review to develop recommendations for conducting additional field investigations of potential TCE source areas, as appropriate.

The site background review may identify potential source areas of TCE impacts to soil and groundwater within Wacker's operations area. If this occurs, the site background review will form the basis for developing a scope of work to further assess each potential source area of contamination. The scope of work could include some or all of data collection goals contained in DEQ's May 31 letter. In any case, Wacker considers a thorough review of site background information essential to developing a technically sound approach to assess potential TCE impacts on the property.

SPECIFIC COMMENTS

Page 5. Task 2. Soil Sample Collection.

MFA agrees with the DEQ that stratigraphy influences the subsurface migration and distribution of potential soil and groundwater contamination at a site. Review of previous work completed in the northern corner of the Wacker property has included continuously sampling geologic material to between approximately 60 feet and 65 feet below ground surface (bgs). Below 60 feet to 65 feet bgs previous workers have collected material for observation at depth intervals of between 5 feet and 10 feet.

In preparing the Work Plan, Wacker instructed MFA to expand the scope of previous drilling programs to include continuous sampling of each borehole. The Work Plan was written accordingly. On page 5 in the first paragraph under "Soil Sample Collection" the Work Plan says, "Soil will be collected continuously, or as site conditions allow, using a

five foot long Macro Core™ sampler designed for use with either 2.125-inch outside diameter (o.d.) or 3,25-inch o.d. drill rods."

Page 5. Task 2. Soil Sample Collection.

Soil samples will be collected immediately upon opening the core. The Work Plan has been revised to provide details regarding the soil sample collection procedure.

Page 6. Task 2. Groundwater Sample Collection.

The shallowest groundwater sample from each borehole will be collected from the uppermost saturated material observed in the field at the time of drilling. This sample is projected for collection from a depth interval of between 25 feet and 35 feet bgs (i.e., from above the top of the intermediate fine-grained material). The Work Plan has been revised to reflect this information.

During the September 17 telephone call, we discussed the DEQ's requests to collect additional groundwater samples from each boring, and to advance borings to depths greater than 100 feet bgs. It is our understanding of that conversation that the DEQ has approved proceeding with the drilling and groundwater sampling scope of work described in the Work Plan. We further understand the Department anticipates that monitoring wells will be installed in the vicinity of boring P-2 in the future, and that the agreed-upon scope of work may not provide sufficient TCE data vertically to select the installation depth(s) of monitoring wells constructed in the deeper fine sand.

Developing an approach for siting, drilling, and installing monitoring wells may become necessary after completion and consideration of the site background review and compilation of geologic and hydrogeologic data collected at the site, including the work described in the Work Plan. Collecting data to support monitoring well installation is beyond the scope of this project. Wacker will consider DEQ's requests for such wells after the current work has been performed and in light of the data acquired.

Page 7. Task 2. Groundwater Sample Collection.

Field water quality parameters will be collected at the time of sample collection. As noted by the Department, the list of parameters that will be measured includes pH, specific

conductance, temperature, and dissolved oxygen. The Work Plan has been modified to include this information.

Page 7. Task 2. Groundwater Sample Analysis.

Wacker agrees to add cyanide to the analyte list included in the Work Plan. The Work Plan has been revised to reflect this expansion of the scope of work.

It is Wacker's understanding that, with the changes noted above, the Work Plan is approved. To facilitate the Department's review of the revised Work Plan, a "redline" version has been provided. Currently, the drilling program is scheduled to begin next Wednesday, September 25. We would appreciate receiving written approval to proceed with the scope of work prior to initiating field work.

Please feel free to call us with questions regarding this letter or the revised Work Plan.

Sincerely,

Maul Foster & Alongi, Inc.

Dana Bayuk, R.G.
Principal Hydrogeologist

Attachments: September 6, 2002 DEQ Letter

Enclosure: Final Work Plan (clean and redline versions)

cc: Rod Struck, DEQ
Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Christopher Reive, Jordan Schrader

Oregon
John A. Kitzhaber, M.D., Governor

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September 6, 2002

Mr. Bob Wyatt
Northwest Natural
220 NW Second Avenue
Portland, OR 97209

Ms. Cathryn Young
Wacker Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210

Re: Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site

Dear Bob and Cathryn:

The Oregon Department of Environmental Quality has reviewed the Work Plan for Supplemental Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site (Work Plan). The Work Plan was submitted by Maul Foster Alongi (MFA) on behalf of Wacker Siltronic Corporation and was received by DEQ on August 16, 2002. The Work Plan was submitted in response to DEQ's letter dated May 31, 2002.

General Comments:

Overall, DEQ supports the proposed work going forward with the modifications requested in the specific comments outlined below. However, DEQ would like to reiterate its concern that the scope of the proposed investigation somewhat limited. The proposed work does not include an evaluation of potential trichloroethene (TCE) source areas nor the installation of monitoring wells as requested in our May 31, 2002 letter. DEQ would like to make it clear that the installation of monitoring wells and characterization of TCE source areas will be required in the future based on the results of this GeoProbe investigation and the review of Wacker information regarding the historic use of TCE at the site.

Specific Comments:

Page 5. Task 2. Soil Sample Collection. Soil samples should be collected on a continuous basis to total depth for the purpose of understanding the stratigraphy at the site, developing the site hydrogeologic conceptual site model and evaluating the migration of dense non-aqueous phase liquid (DNAPL) at the site. The TCE concentrations detected in groundwater clearly indicate the potential presence of DNAPL at the site.

Page 5. Task 2. Soil Sample Collection. In the fifth paragraph, the work plan states that "After the portions of the soil core have been selected, soil samples will be removed....." The timing of these samples is unclear. Soil samples must be collected immediately after opening the soil core to prevent contaminant loss through volatilization.

Page 6. Task 2. Groundwater Sample Collection. The proposed depths of groundwater samples are unclear. The Work Plan states that up to 3 samples will be collected per boring but only two depths are proposed. Groundwater samples should be collected every 10 – 15 feet beginning at the 55 – 60' depth interval to the bottom of the borehole. In addition, a shallow groundwater sample (above the silt) should also be collected. This will provide data on the vertical water chemistry profile and aid the understanding of contaminant migration pathways, the identification of future monitoring well screen intervals and the identification of potential source areas. If possible, samples should be collected at depths greater than 100 feet in order to define the vertical extent of contamination.

Page 7. Task 2. Groundwater Sample Collection. The work plan does not indicate what field parameters will be measured. DEQ assumes at a minimum, temperature, specific conductivity, pH, and dissolved oxygen will be measured.

Page 7. Task 2. Groundwater Sample Analysis. Cyanide has been consistently detected in groundwater at concentrations exceeding AWQC. As a result, cyanide should be included in the target analyte list.

Please have a revised work plan submitted within 3 weeks of the date of this letter. I may be reached at (503) 229-5648 if you wish to discuss this matter further or if you have any questions.

Sincerely,

Eric L. Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section

cc: Mike Rosen, NWR/DEQ
Rod Struck, NWR/DEQ
Jennifer Peterson, NWR/DEQ

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

August 16, 2002

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, OR 97201-4987

Re: Wacker Siltronic Corporation
Work Plan for Supplemental Remedial Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site - 7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At Wacker's request, MFA has prepared this work plan to further assess detections of TCE in the northern corner of the site. The scope of work described in the work plan will allow for more informed interpretations to be made regarding the source, nature, and extent of TCE detected in this portion of the site. An overview of the site background and a description of the most recently collected TCE data are provided in the next section of the work plan.

BACKGROUND

TCE has been detected in groundwater based on data collected by Hahn & Associates, Inc. (HAI) in August 2001[1] and by Limno-Tech, Inc. (LTI) in March 2002[2]. Field work conducted by HAI was done on behalf of Northwest Natural (NW Natural), and included exploratory drilling and soil and reconnaissance groundwater sampling at ten locations, designated P-1 through P-10, and the drilling and installation of three monitoring wells, named WS-8-33, WS-8-59, and WS-9-34 (see Figure 1). TCE was detected in a groundwater sample collected from one of the exploratory borings (P-2, see Figure 1) at a concentration of 11,200 micrograms per liter (ug/L or parts per billion).

On behalf of Wacker, LTI performed follow-up work to assess the TCE detected by HAI. This included further evaluating two releases of wastewater with TCE that occurred in the

[1] Hahn & Associates, Inc., 2001. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Northwest Natural. November 20.
[2] Limno-Tech, Inc., 2002. *Summary of the Remedial Investigation Activities from the Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for Wacker Siltronic Corporation. April 30.

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immediate vicinity of Wacker's wastewater treatment system in December 1984 (see Figure 1). Shortly after the releases occurred, Wacker implemented a series of removal actions to excavate material potentially impacted by the release. Over 150 cubic yards of material was excavated during the course of the removal action(s). Analysis of confirmatory samples indicated that the removal work succeeded in removing TCE to concentrations of less than 1 milligram per kilogram (mg/kg or parts per million).

LTI's field program included drilling three exploratory borings, designated GP02-01, GP02-02, and GP02-03 (see Figure 1), and collecting soil and reconnaissance groundwater samples for analysis. The three exploratory borings were located within (GP02-01), west (GP02-02), and north-northwest (GP02-03) of the 1984 wastewater release area.

Review of data contained in LTI's April 2002 data package indicates the following:

- TCE was not detected in soil and/or groundwater samples collected from GP02-01 to the depth of drilling (i.e., 100 feet below ground surface [bgs]) at laboratory reporting limits of between 0.005 mg/kg and 1 mg/kg for soil, and 1 ug/L for groundwater.

- TCE was detected in soil and groundwater samples collected from GP02-02. The chemical was detected in soil at a maximum concentration of 1.97 mg/kg. TCE was detected in groundwater samples collected at depth intervals of 56 to 60 feet bgs and 96 to 100 feet bgs in concentrations of 21,000 ug/L and 575,000 ug/L, respectively.

- TCE was not detected at or above the reporting limit of 0.005 mg/kg in soil samples collected from GP02-03. TCE was detected in groundwater samples collected at depth intervals of 31 to 35 feet bgs (4.29 ug/L) and 56 to 60 feet bgs (33.4 ug/L).

The results of HAI's and LTI's work were reported to the DEQ in November 2001 and April 2002 respectively. In the May 31 letter to Wacker, the Department provided a list of recommendations for additional work to further evaluate the source and extent of the TCE detections, including:

1. Reviewing Wacker's files and facility construction records to identify potential sources of TCE.

2. Drilling to characterize the stratigraphy beneath the site.

3. Collecting and analyzing soil and groundwater samples from "identified source areas".

4. Evaluation of a source of dense non-aqueous phase liquids in the subsurface.

5. Installation of monitoring wells near exploratory boring GP02-02, in the area of the 1984 wastewater release, and in the vicinity of boring P-2 to assess the lateral and vertical extent of contamination between the release and the Willamette River.

In response to DEQ's May 31 letter, Wacker requested that MFA develop a general approach for further assessing TCE detections in the northern portion of the site. During a meeting on August 1, the general approach was presented to, and agreed upon by the Department. The DEQ agreed upon approach consists of two components. The first component is a site background review to compile historic information regarding Wacker's TCE use at the site. The second component includes a focused soil and groundwater sampling program in the northern corner of Wacker's property.

This work plan (the Work Plan) has been prepared to provide the DEQ with the scope of work for conducting the focused soil and groundwater sampling work in the northern corner of the site. Field work will be performed consistent with applicable portions of HAI's remedial investigation work plan[3] and LTI's supplemental remedial investigation work plan[4]. The scope of work includes descriptions of the drilling procedures, soil and groundwater sampling methods, and the laboratory analytical program for the work.

SCOPE OF WORK

The focused exploratory drilling and soil and groundwater sampling work will be conducted in the northern corner of the Wacker site in the vicinity of boring P-2 (see Figure 2). The objective of the focused sampling program is to assess potential local source area(s) of TCE in the vicinity of boring P-2, and further evaluate the lateral and vertical distribution of the chemical in this portion of the site. The data generated by analyzing soil and groundwater samples collected during the drilling and sampling program will be used in conjunction with the site background review to develop recommendations for conducting additional field investigations of potential TCE source areas, as appropriate. The scope of work is organized into three tasks. Each task is further described below.

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[3] Hahn & Associates, Inc. 2001. *Final Focused Remedial Investigation Work Plan, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* June 1. A work plan submitted to DEQ on behalf of Northwest Natural.

[4] Limno-Tech, Inc. 2002. *Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.* March 6. A work plan submitted to the DEQ on behalf of Wacker.

Task 1 – Project Coordination

Drilling and sampling activities will be scheduled as soon as practicable after the Work Plan is approved by the DEQ. The Department will be provided a minimum notice of one week before field work is initiated. The DEQ will also be verbally notified upon initiation and completion of field drilling and sampling work.

Task 2 - Focused Assessment of TCE Detections in the Northern Corner of the Property

Exploratory drilling and soil and groundwater sampling will be performed using methods similar to those used previously. Four temporary borings will be drilled in the vicinity of boring P-2 using Geoprobe® drilling and sampling equipment (see Figure 2). The borings will be positioned to collect additional soil and groundwater data between P-2 and the northwest property line, between P-2 and boring P-3, between P-2 and boring GP02-03, and between P-2 and the north end of the Fab 1 Building.

The temporary borings will be decommissioned after drilling and sampling work is completed at each location. All of the borings will be drilled, sampled, and decommissioned according to applicable Oregon regulations[5]. The procedures that will be used in the field to conduct exploratory drilling and collect and analyze soil and groundwater samples are described below.

Exploratory Drilling

The locations of the four Geoprobe® borings, designated GP-4 through GP-7, are shown on Figure 2. Geo-Tech Explorations, Inc. of Tualatin, Oregon, (Oregon Monitoring Well Constructor License No. 1011) will provide the Geoprobe® drilling equipment for this project.

Each of the four Geoprobe® borings will be advanced to a projected depth of approximately 100 feet bgs. Based on observations made during the drilling of boring P-2 (see Figure 2), subsurface geologic material generally consists of unconsolidated sand with gravel from near land surface to 32.5 feet bgs (upper sand with gravel); intermediate depth mixtures of silt, sandy silt, silty sand, and fine sand to 53.5 feet bgs (intermediate depth material); and deeper fine sand to the bottom of the borehole at approximately 100 bgs. The depth of shallow groundwater in the upper-most saturated material was observed at a depth

[5] Oregon Water Resources Division. 1995. *Administrative Rules for Construction, Maintenance, and Abandonment of Monitoring Wells and Other Holes in Oregon.*

approximately 28 feet bgs during drilling. In addition, observations made during the drilling of boring P-1 (see Figure 2) indicate that subsurface material becomes "black and tarry" between 29 feet and 31 feet bgs.

Given the information summarized above, MFA recommends that dual-tube Geoprobe® drilling equipment be used for this project. Borings will be advanced from land surface into finer grained intermediate depth material observed between 30 feet and 35 feet bgs. Within this depth range a bentonite slurry seal will be placed in the borehole. The bentonite seal will be a minimum of 5 feet in length. The bentonite seal will be placed to reduce the potential for contamination, if any, encountered at shallow depth intervals to migrate vertically downward and cross-contaminate deeper sampling intervals.

Prior to initiating drilling at the site the drilling equipment and all downhole sampling equipment will be cleaned using a high-pressure hot-water washer.

Soil Sample Collection

Soil samples will be collected during drilling for visual observation and lithologic classification to the bottom depth of each boring. Soil will be collected continuously, or as site conditions allow, using a five foot long Macro Core™ samplers designed for use with either 2.125-inch outside diameter (o.d.) or 3.25-inch o.d. drill rods. Following retrieval, soil will be described in the field by an MFA geologist working under the direct supervision of a geologist registered in the state of Oregon. Soil will be described using American Society for Testing and Materials (ASTM) Designation D2488-84, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)*. Boring logs will be prepared for each of the four borings. Boring logs will include the project name and location, name of the drilling contractor, drilling method, sampling method, sample depths, and descriptions of the soils observed in the samples.

Depth discrete samples of soil will be selected for analysis from up to three depth intervals within the unsaturated zone. Soil samples will be retained using the criteria described by LTI except that the two upper soil samples will be selected for analysis based on measurements made in the field using a photoionization detector or a flame-ionization detector. The third, and deepest, soil sample will be collected from just above the uppermost saturated material observed during drilling at each location (projected between 25 feet and 30 feet bgs).

After the portions of the soil core have been selected, soil samples will be carefully removed from the sampler and placed in laboratory supplied clear glass 8-ounce containers. Sample containers will be labeled and placed on ice in a rigid shipping container with chain-of-custody paper work. A custody seal will be placed over the lid of each shipping container

and taped in place. Samples will be delivered to Columbia Analytical Services, Inc. (CAS), Kelso, Washington for analysis.

Soil Sample Analysis

Up to twelve soil samples (three from each boring) will be collected and submitted to CAS for analysis. The samples will be analyzed for volatile organic compounds (VOCs), including TCE, using USEPA Method 8260B, and for polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270, Selective Ion Method. These two groups of chemicals represent the analytes that have been detected at the most sampling locations at the highest concentrations on the NW Natural and Wacker properties.

Review of data collected previously, suggests that high concentrations of certain chemicals detected in soil and/or groundwater (e.g., PAHs) result in elevated laboratory method reporting limits (MRLs) for VOCs, including TCE. As the goal of this project is to further assess TCE concentrations in the vicinity of P-2, the analytical program for this project will attempt to attain lower MRLs than achieved previously. In order to do this, a series of sample dilutions will be analyzed for each soil and groundwater sample submitted to the laboratory. Using USEPA Method 8260B, the samples will be initially screened at a high dilution factor (e.g., 1:50). The initial screen is intended to quantify target analytes present in the highest concentrations. After this analysis is performed, the results will be reviewed and used to determine an appropriate dilution scheme for that sample. Subsequent analyses will be performed on less diluted samples. Each sample will be analyzed at a dilution that will attain the lowest MRL allowable with respect to method/instrument capabilities and sample analyte concentrations.

Please note, that according to CAS, the approach to diluting/analyzing samples described above does not require modifying USEPA Method 8260B. The unmodified analytical method is used to analyze the series of sample dilutions.

Groundwater Sample Collection

Up to three depth discrete groundwater samples will be collected for analysis from each of the four Geoprobe® borings. Drilling work completed to date suggests that shallow groundwater could occur at the base of the upper unconsolidated sand with gravel between 25 feet and 35 feet bgs. Two groundwater samples will be collected from below the intermediate depth material at depths of between 65 feet and 75 feet bgs and at near the bottom of the borehole projected to be about 100 feet bgs. Samples will be collected using a 5-foot long, 1.5-inch o.d. Geoprobe® water sampler. The sampler will be pushed to the

desired depth and pulled back approximately five feet, exposing the internal stainless steel wire-wrapped well point screen.

The volume of the groundwater inside the screen will be calculated and a minimum of one borehole volume will be removed prior to sample collection. New clean dedicated disposable polyethylene tubing will be connected to a vacuum pump. The vacuum pump will be used to purge the water from the well point screen. Water purged from the boring will be collected in a clean 1-quart jar attached inline between the tubing and the vacuum pump. The water in the 1-quart jar will be used to obtain field measurements with an Orion 1230 water quality meter. The polyethylene tubing will then be removed from the pump and fitted with a stainless steel foot-valve. The tubing and valve will be used to collect the individual samples.

Groundwater samples will be collected using conventional methods associated with the Geoprobe® drilling method. Groundwater will be drawn into the dedicated tubing via the foot-valve attached and using the tubing as an inertia pump. After groundwater is drawn into the tubing, the tubing will be retracted slowly from the rods and coiled. Groundwater will be poured directly from the tubing into the laboratory-supplied containers. Groundwater collected for VOC analysis will be poured in to clear glass 40-milliliter vials. To the maximum extent practicable, the tubing will be handled to minimize agitation of the sample. PAH samples will be collected into 1-liter amber glass bottles.

Field sampling activities (e.g., well-purging data, equipment used, sample containers, preservatives used) will be recorded at time of sample collection on field sampling data sheets.

After the groundwater samples have been collected, they will be labeled and placed on ice in a rigid shipping container with chain-of-custody paper work. A custody seal will be placed over the lid of each shipping container, and then covered with packing tape. Samples will be delivered to CAS in Kelso, Washington for analysis.

Groundwater Sample Analysis

Groundwater samples will be submitted to CAS for analysis of VOCs and PAHs using USEPA Method 8260B and USEPA Method 8270 SIM respectively. Groundwater samples will be analyzed for VOCs using the same analytical approach as described above for soil samples.

Laboratory QA/QC Data Evaluation and Management

Raw data from the field, and from the contract laboratory, will be downloaded into a computerized database (Access) and reviewed for acceptability. Analytical data will be reviewed to assess whether they meet project-specific data quality objectives. Review will be based on accepted USEPA procedures for evaluating data generated from the analysis of organic chemicals[6]. After completing the data review, a summary report will be prepared to support specific or routine report deliverables.

Task 3 - Reporting

The results of the focused soil and groundwater sampling will be incorporated into a report summarizing the work completed at the Wacker site to date. The report will provide an overview of the regulatory status of site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site. The report will also include tables that provide drilling and construction details for on-site exploratory borings and monitoring wells, historic groundwater elevation measurements, and compilations of analyte detections. Figures will be included that show sampling locations, illustrate subsurface geologic interpretations (i.e., generalized geologic cross-sections), and depict the hydraulic gradient at selected depths beneath the site. Copies of logs of exploratory borings and monitoring wells, compiled soil and groundwater data, and laboratory analytical reports will be attached to the report as supporting documentation.

The data collected from the focused sampling program, previous on-site geologic and hydrogeologic evaluations, and the site background review, will form the basis for developing recommendations for assessing potential source areas of TCE impacts in the northern portion of the Wacker site.

SCHEDULE

Work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site will be initiated upon obtaining DEQ's written approval of this Work Plan. Subject to drilling subcontractor availability, MFA projects that field work will be initiated 15 to 20 business days from receiving Work Plan approval. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil

[6] USEPA. 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Organics Data Review.* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA 540/94/012. February.

SCHEDULE

Work related to the focused soil and groundwater sampling program of the northern corner of the Wacker site will be initiated upon obtaining DEQ's written approval of this Work Plan. Subject to drilling subcontractor availability, MFA projects that field work will be initiated 15 to 20 business days from receiving Work Plan approval. Drilling and sampling activities are projected for completion in 15 to 20 business days. Based on analyzing soil and groundwater samples on a normal turn-around basis, and depending on the laboratory's backlog, the final laboratory analytical reports should be available for review with 15 to 20 business days of receipt of the samples by the laboratory. Preparation of the data summary report will be initiated upon DEQ's approval of the Work Plan. Based on the timeframe outlined for the focused sampling program, MFA projects that the site summary report will be submitted to DEQ by the middle of December.

Please feel free to contact with questions and/or comments about this letter, or if you need additional assistance.

Sincerely,

Maul Foster & Alongi, Inc.

Dana S. Bayuk
Principal Hydrogeologist

Attachment: Figures 1 and 2

Cc: Rod Struck, DEQ
Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Christopher Reive, Jordan Schrader

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WILAMETTE RIVER

P-8
P-9
WS8-59
P-5
P-11
P-2
P-3
P-4
P-6
P-7
WS8-33
WS9-34
ADMINISTRATION BUILDING
P-1
1984 WASTE WATER RELEASE LOCATION
GP02-03
FAB I BUILDING
GP02-02
GP02-01
UTILITIES BUILDING
ACID SOLVENT STORAGE
WAREHOUSE
FACILITIES BUILDING
ELECTRICAL SUBSTATION
FAB 2 BUILDING
UTILITY EASMENT
FAB 1 WASTE WATER TREATMENT PLANT
FAB 2 WASTE WATER TREATMENT PLANT
W-3-81
WS-3
WS-1
WS-2
WS-4
WS-6
WS-7
WS-5
NW ST. HELENS ROAD

LEGEND:
PROPERTY BOUNDARY
EXISTING MONITORING WELL
ABANDONED MONITORING WELL
GEOPROBE (PUSH-PROBE) SAMPLE LOCATION
FORMER LOWLAND PONDED AREA

0 120 240
SCALE IN FEET

NOT FOR CONSTRUCTION

PRELIMINARY DRAFT

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 07/11/02 DWN BY JLN DES BY DSB CHK BY APP BY

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MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
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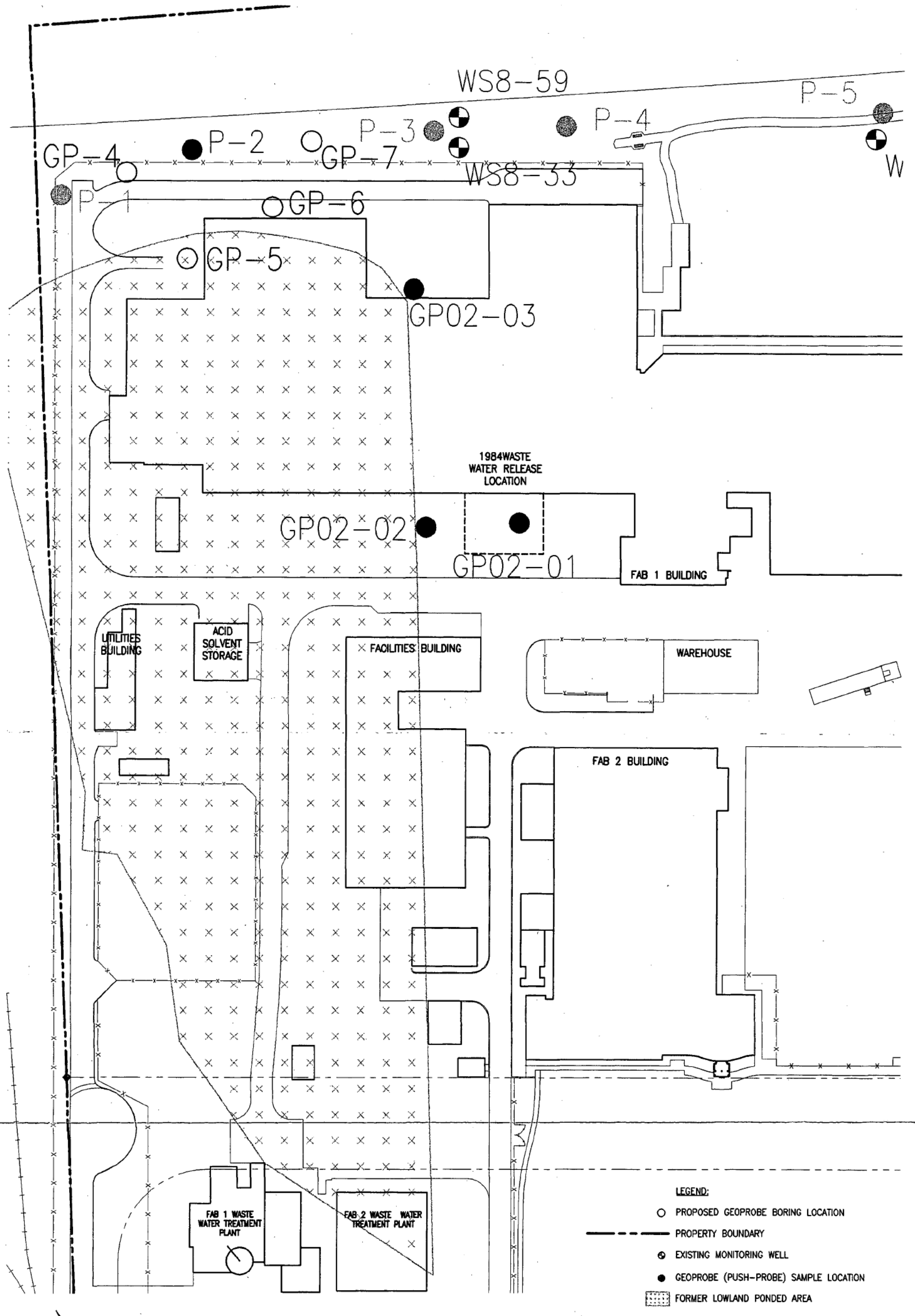
SITE FEATURES

DRAWING NO. 1
PROJECT NO. 8128.01.03

File: G:\8000\8128-01_WACKER SILTRONIC\001\PRESENTATION-MEETING\SITE-FEATURES.DWG Last edited: AUG. 16, 2002 @ 12:58 p.m. by: jness Xrefs: SITE-BASE black/white

LAYOUT: 1



NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 07/11/02 DWN BY JLN DES BY DSB CHK BY APP BY

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MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

PROPOSED GEOPROBE BORING LOCATIONS

DRAWING NO. 2

PROJECT NO. 8128.01.03

File: G:\8000\8128-01_WACKER SILTRONIC\001\PRESENTATION-MEETING\PROPOSED SAMPLES.DWG Last edited: AUG. 16, 2002 @ 12:57 p.m. by: jness Xrefs: SITE-BASE black/white

LAYOUT: 2

MAUL FOSTER ALONGI
ENVIRONMENTAL & ENGINEERING CONSULTANTS

PORTLAND, OREGON
SEATTLE, WASHINGTON
VANCOUVER, WASHINGTON

November 15, 2002
Project 8128.01.04

Mr. Eric Blischke
Coordinator, Portland Harbor
Oregon Department of Environmental Quality
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: November 15, 2002 Progress Report
Wacker Siltronic Corporation Site — 7200 NW Front Avenue, Portland, Oregon 97210

Dear Eric:

At the request of Wacker Siltronic Corporation (Wacker), Maul Foster & Alongi, Inc. (MFA) has prepared this status update for the above-referenced site (see Figure 1). This letter has been prepared consistent with Section 6 (General Provisions), Item G (Progress Reports) of the Oregon Department of Environmental Quality (DEQ or Department) Order No. ECVC-NWR-00-27 (the Order). It is our understanding that this letter also satisfies the schedule and content requirements specified in DEQ's information request(s) made in their November 1, 2002 letter to Wacker.

Work Completed During the Previous Month

Exploratory drilling and reconnaissance soil and groundwater sampling were completed in the northern corner of the Wacker property on October 8, 2002. During the course of the field program four Geoprobe™ borings, designated GP-4, GP-5, GP-6, and GP-7, (see Figure 2) were drilled to depths of approximately 100 feet below ground surface. Drilling and sampling were conducted to further evaluate the horizontal and vertical distribution of trichloroethene (TCE) previously detected at boring P-2[1] (see Figure 2). Copies of the logs prepared for each Geoprobe™ boring are attached for your information.

Soil and groundwater samples collected during the field program were submitted to Columbia Analytical Services, Kelso, Washington (CAS) for analysis. Consistent with the *Wacker Siltronic Corporation, Final Work Plan for Supplemental Remedial*

[1] Hahn and Associates, Inc. 2001. *Data Package for Focused Remedial Investigation, Wacker Siltronic Corporation Property, 7200 NW Front Avenue, Portland, Oregon.* A report prepared for NW Natural. November 20.

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Investigation to Further Assess Trichloroethene Detections in the Northern Corner of Wacker Siltronic Corporation Site—7200 NW Front Avenue, Portland, Oregon 97210, dated September 20, 2002 (the Work Plan), selected soil samples were analyzed for volatile organic compounds (VOCs), including TCE, and polycyclic aromatic hydrocarbons (PAHs). CAS analyzed groundwater samples for VOCs, PAHs, and cyanide. The final laboratory analytical report package was received by MFA the first week of November 2002.

Subsequent to receipt of the package, the analytical data and the laboratory quality assurance/quality control information was reviewed by MFA using appropriate data review guidelines[2][3]. Copies of the laboratory reports and MFA's laboratory data review memorandum are attached for your information. Compilations and discussions of the data contained in the laboratory reports will be provided in the data summary report that is currently in preparation.

In addition to analysis of soil and groundwater samples, preparation of the site background review report and the site data summary report continued during the reporting period.

Anticipated Upcoming Activities

During the next month, preparation of the site background review and site data summary reports will continue. Per the DEQ's November 1, 2002 letter, these two reports are to be submitted to the Department no later than December 10, 2002. The site background review report will provide the DEQ with descriptions of Wacker's operations involving TCE, including information regarding Wacker's historical use and management of the chemical, and discussion(s) of releases to the environment that could have resulted in TCE contamination beneath the property. The site data summary report will provide the Department with an overview of the regulatory status of the site, interpretations regarding the subsurface geology, a preliminary conceptual site hydrogeologic model, and preliminary interpretations regarding the distribution of soil and groundwater impacts at the site.

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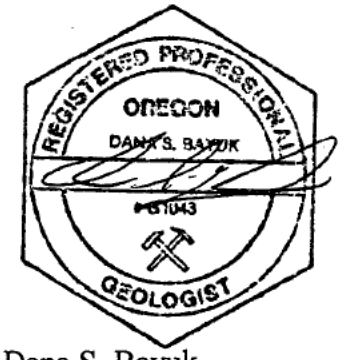
[2] USEPA. 1994a. *USEPA Contract Laboratory Program, National Functional Guidelines for Inorganics Data Review.* Office of Emergency and Remedial Response, U.S. Environmental Protection Agency. EPA 540/R-94/013. February.

[3] USEPA. 1999. *USEPA Contract Laboratory Program, National Functional Guidelines for Organics Data Review.* Office of Emergency and Remedial Response, U.S. Environmental Protection Agency. EPA 540/R-99/008. October.

Please feel free to contact us with questions regarding this letter.

Sincerely,

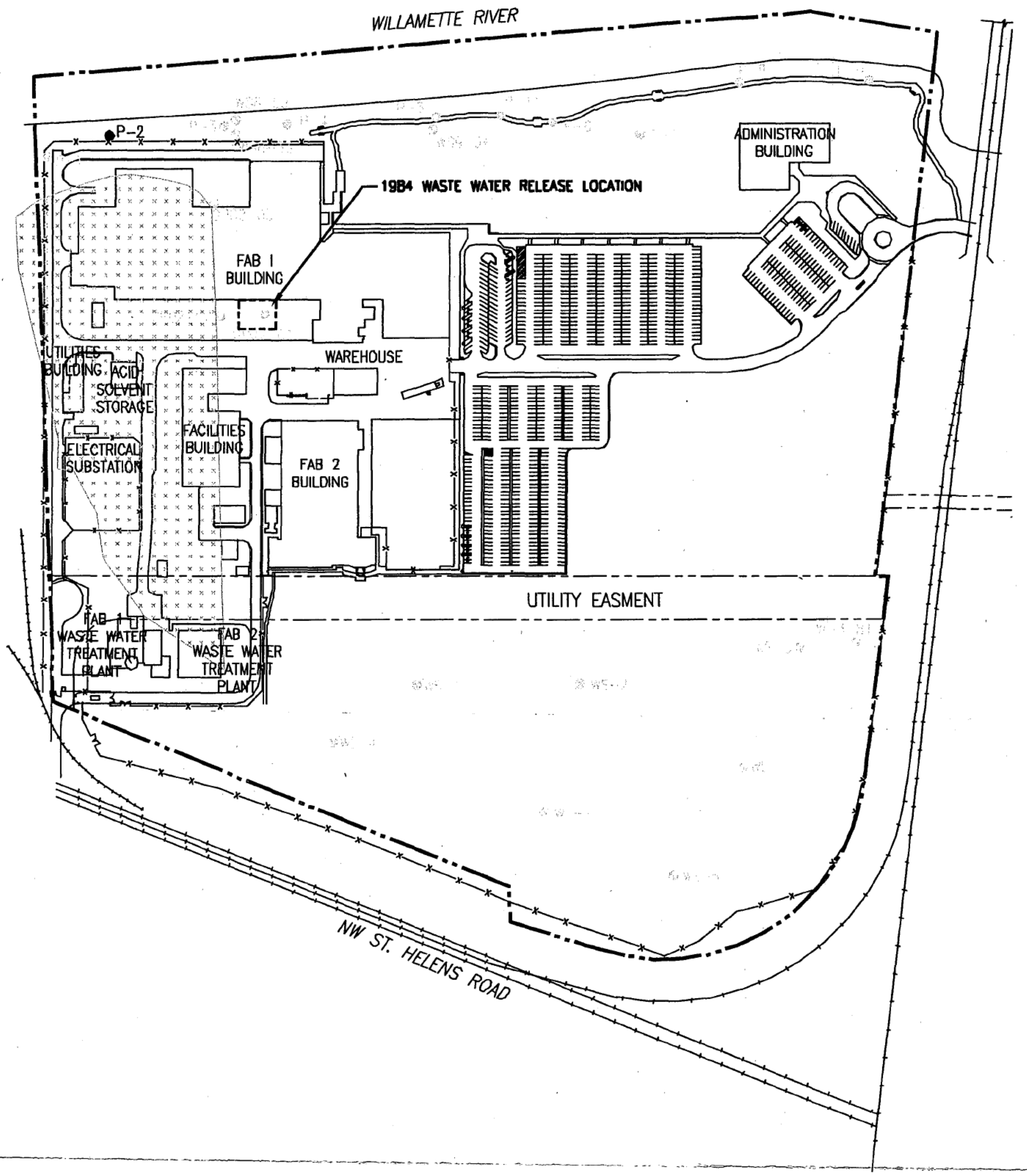
Maul Foster & Alongi, Inc.



Dana S. Bayuk
Principal Hydrogeologist

Attachments: Figures 1 and 2
Boring Logs
Laboratory Analytical Reports
Data Review Memorandum

cc: Rod Struck, DEQ
Cathryn Young, Wacker
Tom McCue, Wacker
Myron Burr, Wacker
Bob Wyatt, NW Natural
Christopher Reive, Jordan Schrader



LEGEND:

- PROPERTY BOUNDARY
- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- GEOPROBE (PUSH-PROBE) SAMPLE LOCATION
- FORMER LOWLAND PONDED AREA

0 120 240
SCALE IN FEET

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 07/11/02 DWN BY JLN DES BY DSB CHK BY APP BY

Suite D
7123 NE Hazel Dell Ave.
Vancouver, WA 98665
360.694.2691
360.906.1958

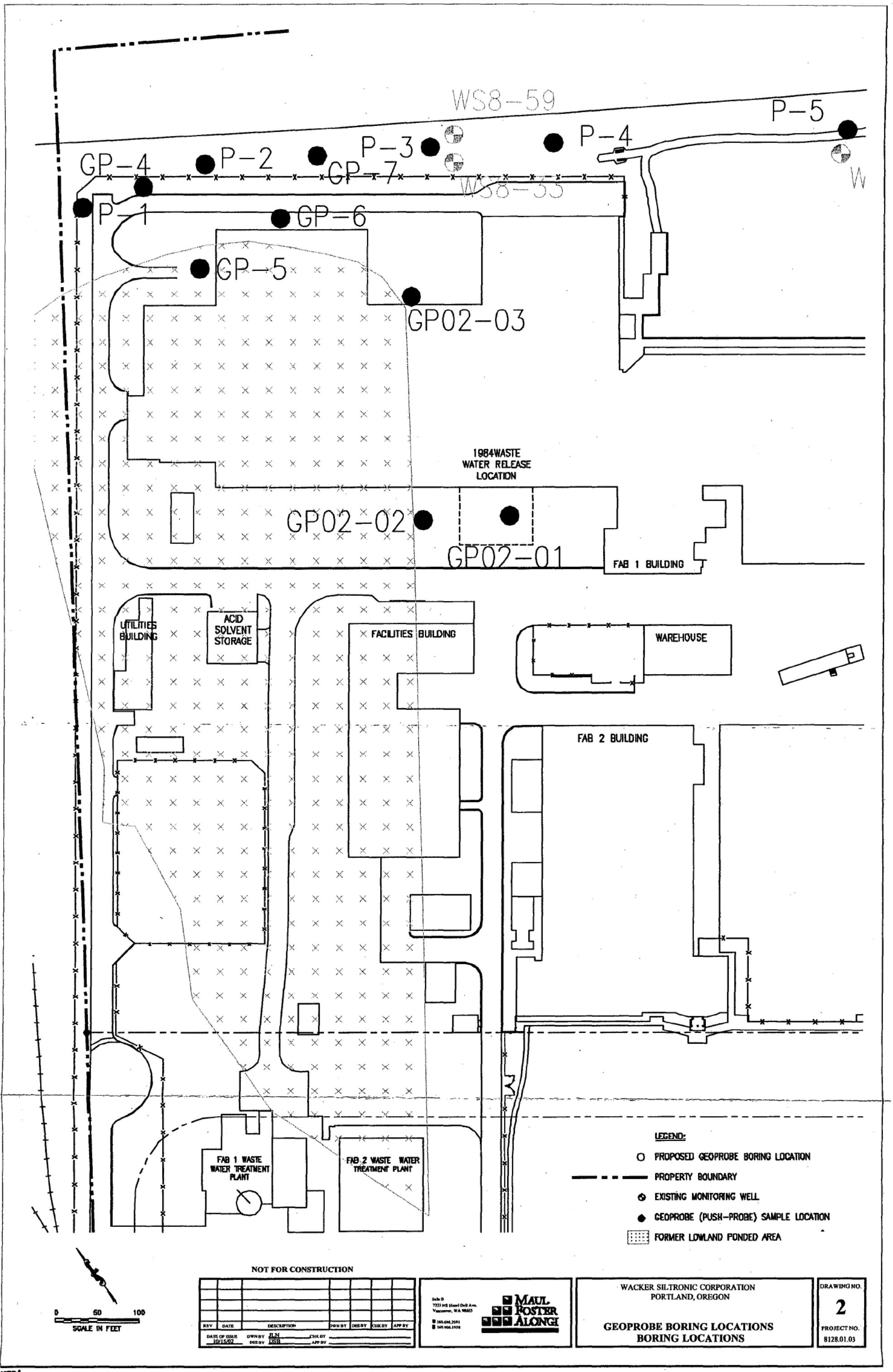
MAUL FOSTER ALONGI

WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

SITE FEATURES

DRAWING NO. 1

PROJECT NO. 8128.01.03



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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	9/26/02 to 9/30/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			75%	GP					0.0 to 0.2 feet: GRAVEL (GP); light brown; 100% gravel, medium, subangular; dry to moist. Trace organic debris.
1									0.2 to 20.0 feet: GRAVELLY SAND (SW); brown; 75-80% sand, fine to coarse; 15-20% gravel, fine to coarse, subrounded; 5% fines; moist.
2									
3									
4						PID = 1.9 ppm			
			90%	GP					
5									
6									
7									
8						GP4-S-7.5 PID = >2 ppm			@ 7.5 feet: Collected soil sample GP4-S-7.5. @ 7.7 feet: 3.5-inch layer of agglutinated sand, black.
			90%	GP					
9									
10									
11									
12						PID = 4.7 ppm			
			100%	GP					
13									
14						PID = 0.0 ppm			
15									
16									
			100%	GP					
17									
18									
19						GP4-S-19.0 PID = 5.0 ppm			@ 19.0 feet: Collected soil sample GP4-S-19.0.
20									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	2 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			70%	GP		PID = 1.0 ppm			19.7 to 20.0 feet: Foreign piece of rubber material. 20.0 to 28.0 feet: GRAVELLY SAND (SW); dark grey; 55% sand, fine to coarse; 40% gravel, fine to coarse, subrounded; 5% fines; moist.
22									
23									
24			100%	GP					
25									
26						GP4-S-26.0 PID = 0.0 ppm			@ 26.0 feet: Collected soil sample GP4-S-26.0.
27									
28			100%	GP					@ 28.0 feet: Softer drilling noted by driller. 28.0 to 29.5 feet: SANDY SILT (ML); dark grey; 60% fines, low plasticity; 40% sand, fine to coarse; moist to very moist.
29									
30									29.5 to 37.5 feet: SILT (ML); dark grey; 85-95% fines, high plasticity; 5-15% sand, fine; moist to wet.
31	∇								
32			100%	GP					32.0 to 36.0 feet: Dark grey with light brown mottling.
33									
34									
35									
36			100%	GP					36.0 to 37.5 feet: Dark grey with orangish brown mottling.
37									
38						PID = 0.0 ppm			37.5 to 37.8 feet: SILTY SAND (SM); dark grey with light brown mottling; 70% sand, fine to medium; 30% fines, low plasticity; wet. 37.8 to 39.0 feet: SILT (ML); dark grey with orangish brown mottling; 85% fines, medium to high plasticity; 15% sand, fine; wet.
39									39.0 to 40.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium; 15% fines, non plastic; wet.
40			100%	GP					40.0 to 44.0 feet: SILT (ML); dark grey; 80 to 90% fines, high plasticity; 10 to 20% sand, fine to medium; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

∇ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.0 ppm			
44									44.0 to 45.0 feet: SILTY SAND (SM); dark grey; 60% sand, fine to medium; 40% fines, medium plasticity; wet.
45			90%	GP					45.0 to 48.5 feet: SAND (SW); light brown; 95% sand, fine to coarse, poorly sorted, 5% fines; wet.
46									
47						PID = 0.0 ppm			
48									
49									48.5 to 53.0 feet: SILT (ML); dark grey; 90-95% fines, high plasticity; 5-10% sand, fine; wet.
50			90%	GP					
51									
52						PID = 0.0 ppm			
53									53.0 to 54.0 feet: SANDY SILT (ML); dark grey; 60% fines, medium plasticity; 40% sand, fine; wet.
54									54.0 to 55.0 feet: SILT (ML); dark grey; 90% fines, medium to high plasticity; 10% sand, fine; wet. Trace organic debris, leaves.
55			80%	GP					55.0 to 57.0 feet: SILTY SAND (SM); dark grey with light brown mottling; 85% sand, fine to coarse; 15% fines, low plasticity; wet.
56									
57						PID = 0.0 ppm			57.0 to 58.0 feet: SANDY SILT (ML); dark grey; 70% fines, medium plasticity; 30% sand, fine; wet.
58									58.0 to 60.0 feet: SILTY SAND (SM); dark grey with light brown mottling; 85% sand, fine to coarse; 15% fines, low plasticity; wet.
59									
60			100%	GP					60.0 to 75.0 feet: SAND (SW); dark grey; 95% sand, fine to coarse, poorly sorted; 5% fines; micaceous; wet.
61									
62									
63						PID = 0.0 ppm			
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			80%	GP					
66				GW					
67						PID = 0.0 ppm			
68						GP4-W-68.0			@ 68.0 feet: Collected water sample GP4-W-68.0. Screened from 66.0 to 70.0 feet bgs.
69									
70			100%	GP					
71									
72									
73						PID = 0.0 ppm			
74									
75			90%	GP					75.0 to 77.0 feet: SAND (SP); dark grey; 95% sand, fine, angular, well sorted; 5% fines; wet.
76									
77						PID = 0.0 ppm			77.0 to 79.0 feet: SANDY SILT (ML); dark grey; 75 to 85% fines, medium plasticity; 15 to 25% sand, fine; wet.
78									
79									79.0 to 80.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine, subangular; 15% fines, medium plasticity; wet.
80			90%	GP					80.0 to 85.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; wet.
81									
82									
83						PID = 0.0 ppm			
84									
85			90%	GP					85.0 to 88.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subangular; 15% fines, non plastic; micaceous; wet.
86									
87									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP4	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									88.0 to 91.0 feet: SILT (ML); dark grey; 90% fines, medium to high plasticity; 10% sand, fine; micaceous; wet.
89									
90			50%	GP					
91									91.0 to 100.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
92									
93									
94									
95			80%	GP					
96				GW					
97									
98						GP4-W-98.0			@ 98.0 feet: Collected water sample GP4-W-98.0. Screened from 96.0 to 100.0 feet bgs.
99									
100									

Total Depth = 100.0 feet below ground surface.

<u>Borehole Completion Details</u>
0.0 to 36.0 feet bgs: dual tube sampling system.
0.0 to 36.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
36.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
36.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed after collecting water sample at 68 feet bgs.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	10/7/02 to 10/8/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP					0.0 to 2.0 feet: SANDY GRAVEL (GW); light brown; 75% gravel, fine to coarse, subangular to subrounded; 20% sand, fine to coarse, subrounded; 5% fines; moist.
2						PID = 0.0 ppm			2.0 to 4.0 feet: GRAVELLY SAND (SW); light brown; 85% sand, fine to course, subrounded to rounded; 10% gravel, fine to medium, rounded; 5% fines; moist.
3									
4			95%	GP					4.0 to 9.0 feet: SAND (SP); dark brown; 95% sand, fine to medium, subrounded to rounded, moderately sorted; 5% fines; moist.
5									
6						PID = 0.0 ppm			
7									
8			90%	GP					@ 8.0 feet: One 2-inch diameter clast found.
9									9.0 to 11.0 feet: GRAVELLY SAND (SW); brown; 60% sand, fine to coarse, subrounded; 40% gravel, fine to medium, subangular to subrounded; micaceous; moist.
10						PID = 0.0 ppm			
11									11.0 to 22.0 feet: SAND (SP); brown; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; moist.
12			80%	GP					
13						GP5-S-13.0			@ 13.0 feet: Collected soil sample GP5-S-13.0.
14						PID = 0.6 ppm			
15									
16			75%	GP					
17									
18									
19						PID = 0.0 ppm			
20									19.5 to 22.0 feet: Grey; moderately sorted. Trace organic debris.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	2 of 5

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data: Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			75%	GP					
21						GP5-S-21.0 PID = 3.1 ppm			@ 21.0 feet: Collected soil sample GP5-S-21.0.
22									22.0 to 24.0 feet: GRAVELLY SAND (SW); grey; 65% sand, fine to medium, subrounded; 30% gravel, fine to medium, subrounded; 5% fines; micaceous; moist.
23									
24			100%	GP					24.0 to 28.0 feet: SILT (ML); olive grey with orange-brown mottling; 85-95% fines, medium to high plasticity; 5-15% sand, fine; micaceous; moist.
25									
26						GP5-S-26.0 PID = 0.0 ppm			@ 25.5 feet: 1 1/2-inch by 1/16-inch plant root. @ 26.0 feet: Collected soil sample GP5-S-26.0.
27									
28			100%	GP					28.0 to 29.0 feet: SILTY SAND (SM); brown; 80% sand, fine to coarse, rounded; 20% fines, low plasticity; moist to wet.
29									29.0 to 32.0 feet: SILT (ML); brown with orange-brown mottling; 85% fines, high plasticity; 15% sand, fine; moist to very moist. Trace rootlets.
30			100%	GP					
31									
32									32.0 to 37.5 feet: SILTY SAND (SM); brown; 80-90% sand, fine, subrounded; 10-20% fines, non to low plasticity; micaceous; wet.
33									
34		▽							
35			80%	GP					35.0 to 37.5 feet: Brown with reddish brown oxidized zones.
36									
37									
38									37.5 to 38.0 feet: SILT (ML); brown with reddish orange oxidizing zones; 85% fines, high plasticity; 15% sand, fine, subrounded; micaceous; wet.
39									38.0 to 40.0 feet: SILTY SAND (SM); brown with reddish brown oxidizing zones; 90% sand, fine, subrounded; 10% fines, non plastic; micaceous; wet.
40			80%	GP					40.0 to 42.5 feet: SAND (SP); brown; 95% sand, fine to medium, rounded, moderately sorted; 5% fines; micaceous; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP5	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43									42.5 to 46.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine, rounded; micaceous; wet.
44									
45			100%	GP					45.0 to 46.0 feet: Olive grey. Trace shell fragments.
46									46.0 to 47.2 feet: SILTY SAND (SM); olive grey; 80% sand, fine, subrounded; 20% fines, low plasticity; micaceous; wet. Trace organic debris and shell fragments.
47									47.2 to 52.5 feet: SAND (SP); dark grey; 95% sand, fine, subrounded to rounded, well sorted; 5% fines; micaceous; wet. Trace organic debris and shell fragments.
48									
49									
50			100%	GP					
51									
52									
53									52.5 to 53.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; wet. Trace organic debris.
54									53.0 to 54.5 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; wet. Trace organic debris.
55			100%	GP					54.5 to 58.0 feet: SILTY SAND (SM); dark grey; 75-85% sand, fine to medium, subrounded; 15-25% fines, low plasticity; micaceous; wet. Trace organic debris.
56									
57									
58						PID = 3.9 ppm			58.0 to 59.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
59									59.0 to 60.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.
60			100%	GP					60.0 to 61.0 feet: SILTY SAND (SM); dark grey; 75% sand, fine, subrounded; 25% fines, low plasticity; micaceous; wet.
61									61.0 to 62.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
62									62.0 to 62.5 feet: SILTY SAND (SM); dark grey; 75% sand, fine, subrounded; 25% fines, low plasticity; micaceous; wet.
63									62.5 to 70.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet. Trace organic debris.
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8128.01.04	GP5	4 of 5

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data: Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			80%	GP					
66				GW					
67									
68						PID = 3.1 ppm GP5-W-68.0			@ 68.0 feet: Collected water sample GP5-W-68.0. Screened from 66.0 to 70.0 feet bgs.
69									
70			100%	GP					70.0 to 71.0 feet: SILTY SAND (SM); dark grey; 65 to 75% sand, fine, subrounded to rounded; 25 to 35% fines, low to medium plasticity; micaceous; wet.
71									71.0 to 74.0 feet: SILT (ML); dark grey with brownish orange mottling; 85-95% fines, high plasticity; 5-15% sand, fine; micaceous; wet. Trace shell fragments.
72									
73						PID = 2.3 ppm			
74									74.0 to 76.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
75			90%	GP					
76									76.0 to 76.5 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
77									76.5 to 81.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
78						PID = 2.3 ppm			
79									
80			80%	GP					
81									81.0 to 84.0 feet: SILT (ML); dark grey; 85% fines, medium to high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris and shell fragments.
82									
83									
84									84.0 to 95.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular to subrounded, moderately sorted; 5% fines; micaceous; wet. Trace organic debris.
85			90%	GP					
86									
87									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8128.01.04	GP5	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88									
89									
90			80%	GP					
91									
92									
93						PID = 125.4 ppm			@ 92.6 feet: 2-inch lens of SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
				GW					
94									
95			90%	GP		GP5-W-95			95.0 to 96.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; micaceous; wet.
96									@ 95.0 feet: Collected water sample GP5-W-95.0. Screened from 93.0 to 97.0 feet bgs.
97									96.0 to 99.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.
98						PID = 111.8 ppm			@ 97.5 feet: 2-inch lens of SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
99									99.0 to 99.5 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
100									99.5 to 100.0 feet: SAND (SP); dark grey; 95% sand, fine, subrounded, well sorted; 5% fines; micaceous; wet.

Total Depth = 100.0 feet below ground surface.

<u>Borehole Completion Details</u>

0.0 to 28.0 feet bgs: dual tube sampling system.
0.0 to 28.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
28.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
28.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	9/30/02 to 10/2/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP					0.0 to 1.0 feet: SILTY GRAVEL (GM); dark brown; 50% gravel, fine to coarse, subrounded; 50% fines, low to medium plasticity; moist. Trace sand.
									1.0 to 4.0 feet: SAND (SW); light brown; 95% sand, fine to coarse, subrounded to subangular, poorly sorted; 5% fines; moist.
2									
3									
4			75%	GP					4.0 to 16.0 feet: GRAVELLY SAND (SW); light brown; 75% sand, fine to coarse, subrounded; 20% gravel, fine to medium, subangular to subrounded; 5% fines; moist.
5									
6									
7						PID = 0.0 ppm			
8			75%	GP					
9						PID = 1.0 ppm			
10									
11									
12			75%	GP					
13									
14									
15						GP6-S-15.0 PID = 1.2 ppm			@ 15.0 feet: Collected soil sample GP6-S-15.0.
16			75%	GP					16.0 to 22.0 feet: SAND (SW); light brown; 95% sand, fine to coarse, subangular, poorly sorted; 5% fines; moist.
17									@ 17.0 feet: 1/8-inch layer of agglutinated sand, black.
18									@ 18.0 feet: 1/8-inch layer of agglutinated sand, black.
19						PID = 0.0 ppm			@ 19.0 feet: 1/2-inch layer of agglutinated sand, black.
20									@ 19.5 feet: woody debris

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	2 of 5

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Number	Sample Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			75%	GP					
22									22.0 to 23.0 feet: SAND (SP); grey; 95% sand fine to medium, subangular, moderately sorted; 5% fines; micaceous; moist.
23						GP6-S-23.0 PID = 1.5 ppm			23.0 to 24.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine; 20% fines, low plasticity; moist. @ 23.0 feet: Collected soil sample GP6-S-23.0. @ 23.5 feet: 6-inch layer with woody debris.
24			75%	GP					
25						PID = 1.2 ppm			24.5 to 27.7 feet: GRAVELLY SAND (SW); grey; 80% sand, fine to medium, subangular; 15% gravel, fine to medium, rounded, light brown clasts; 5% fines; micaceous; moist.
26									
27									
28			100%	GP					27.7 to 28.0 feet: SILT (ML); grey; 80% fines, medium plasticity; 20% sand, fine; micaceous; moist.
29									28.0 to 29.0 feet: GRAVELLY SAND (SW); grey; 60% sand, fine to medium, subangular; 30% gravel, fine to medium, rounded; 10% fines; moist.
30						GP6-S-30.0 PID = 0.0 ppm			29.0 to 32.0 feet: CLAYEY SILT to SILTY CLAY (ML); light brown with reddish brown mottling; 100% fines, high plasticity; moist to very moist. @ 30.0 feet: Collected soil sample GP6-S-30.0.
31									
32			0%	GP					32.0 to 35.0 feet: NO RECOVERY; heave material in sampler suggests; SILTY SAND (SM); dark brown; 75% sand, fine to medium, subrounded; 25% fines, low to medium plasticity; moist to wet.
33									
34		▽							
35			100%	GP					35.0 to 40.0 feet: SANDY SILT (ML); reddish brown with dark reddish brown mottling; 80% fines, high plasticity; 20% sand, fine; micaceous; wet.
36									
37									37.0 to 40.0 feet: Light grey with reddish brown mottling.
38						PID = 2.1 ppm			
39									
40			100%	GP					40.0 to 44.5 feet: SANDY SILT to SILT (ML); grey; 65 to 85% fines, medium to high plasticity; 15 to 35% sand, fine, rounded; micaceous; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 1.1 ppm			
44									
45			100%	GP					44.5 to 45.0 feet: SILTY SAND (SM); grey; 70-80% sand, fine to medium, subrounded; 20-30% fines, low to medium plasticity; micaceous; wet.
46									45.0 to 46.0 feet: SILTY SAND to SAND (SM-SP); dark grey; 90% sand, fine to medium, subrounded to rounded; 10% fines, low to medium plasticity; micaceous; wet. Heave material?
47									46.0 to 47.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
48						PID = 0.2 ppm			47.0 to 50.0 feet: SILTY SAND (SM); light brown with reddish brown mottling; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
49									
50			100%	GP					50.0 to 54.0 feet: SILTY SAND to SAND (SM-SP); grey; 85-90% sand, fine to medium, subrounded to rounded; 10% non plastic fines; 5% organic debris; micaceous; wet. Heaving sands.
51									51.0 to 54.0 feet: Light brown.
52									
53						PID = 0.2 ppm			
54									54.0 to 55.0 feet: SILTY SAND (SM); light grey to grey; 50-75% sand, fine, rounded; 25-50% fines, low to medium plasticity; micaceous; wet.
55			90%	GP					
56									56.0 to 57.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; wet.
57									57.0 to 58.0 feet: SILTY SAND (SM); grey; 80% sand, fine, subrounded; 20% fines, low plasticity; wet. Trace organic debris.
58						PID = 0.2 ppm			58.0 to 60.0 feet: SILTY SAND to SAND (SM-SP); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low to medium plasticity; wet.
59									
60			50%	GP					60.0 to 65.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, rounded, moderately sorted; 5% fines; micaceous; wet.
61									
62									
63						PID = 0.0 ppm			
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP6	4 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					65.0 to 67.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine, rounded; micaceous; wet.
66									
67									67.0 to 68.0 feet: SANDY SILT (ML); dark grey; 60% fines, medium plasticity; 40% sand, fine, subrounded to rounded; micaceous; wet.
68						PID = 2.1 ppm			68.0 to 70.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine, rounded; micaceous; wet. Trace organic debris.
69									
70			75%	GP					70.0 to 77.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
71									
72				GW					
73						PID = 1.1 ppm			
74						GP6-W-74.0			@ 74.0 feet: Collected water sample GP6-W-74.0. Screened from 72.0 to 76.0 feet bgs.
75			90%	GP					
76									
77									77.0 to 79.0 feet: SILTY SAND (SM); dark grey; 50% sand, fine to medium, subrounded; 50% fines, high plasticity; micaceous; wet.
78						PID = 2.1 ppm			
79									79.0 to 80 feet: SANDY SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
80			80%	GP					80.0 to 85.0 feet: SAND (SP); 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
81									
82									
83						PID = 4.0 ppm			
84									
85			80%	GP					85.0 to 87.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low to medium plasticity; micaceous; wet.
86									
87									87.0 to 89.0 feet: SAND (SP); 95% sand, fine to medium, rounded,

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 8128.01.04	Well Number GP6	Sheet 5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 8.2 ppm			moderately sorted; 5% fines; micaceous; wet.
89									89.0 to 89.5 feet: SANDY SILT (ML); dark grey; 60% fines, medium to high plasticity; 40% sand, fine to medium; micaceous; wet. Silt nodules 1/2-inch diameter.
90			90%	GP					89.5 to 90.0 feet: SILT (ML); dark grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
91									90.0 to 100.0 feet: SAND (SP); 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet. Silt nodules 1/2-inch diameter.
92									
93						PID = 54.0 ppm			
94									
95			90%	GP					
96				GW					
97									
98						PID = 43.0 ppm GP-W-98.0 GP-DUP			@ 98.0 feet: Collected water sample GP5-W-98.0 and duplicate GP-DUP. Screened from 96.0 to 100.0 feet bgs.
99									
100									

Total Depth = 100.0 feet below ground surface.

Borehole Completion Details

0.0 to 32.0 feet bgs: dual tube sampling system.
0.0 to 32.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
32.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
32.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval. 7.) DUP = duplicate sample.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Geologic Borehole Log/Well Construction

Maul Foster & Alongi, Inc.

Project Number	Well Number	Sheet
8128.01.04	GP7	1 of 5

Project Name	Wacker Siltronic Corporation	TOC Elevation (feet above MSL)	N/A
Project Location	7200 NW Front Avenue, Portland Oregon 97210	Surface Elevation (feet above MSL)	N/A
Start/End Date	10/2/02 to 10/4/02	Northing	
Driller/Equipment	Geo-Tech Explorations, Inc./Geo-Probe	Easting	
Geologist/Engineer	Tony J. Silva/Anthony C. Bharwada	Hole Depth	100.0-feet
Sample Method	Geo-Probe	Outer Hole Diam	3.25 / 2.0-inch

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
1			90%	GP		PID = 5.6 ppm			0.0 to 2.0 feet: SANDY GRAVEL (GW); dark brown to light brown; 80% gravel, fine to coarse, angular to rounded; 20% sand, fine to coarse; moist. Plant roots to 3 inches. Three larger clasts 2-inch diameter.
2									2.0 to 13.0 feet: SAND (SW); brown, 90% sand, fine to coarse, subrounded, poorly sorted; 5% gravel, fine to medium, subrounded to rounded; 5% fines; micaceous; moist.
3									
4			90%	GP					
5									
6									
7						PID = 3.5 ppm			
8			75%	GP					
9						GP7-S-9.0 PID = 5.6 ppm			@ 9.0 feet: Collected soil sample GP7-S-9.0.
10									
11									
12			90%	GP					
13						PID = 7.0 ppm			13.0 to 13.5 feet: SILTY SAND (SM); dark grey; 75% sand, fine; 25% fines, medium plasticity; moist. One larger 2-inch diameter clast found at 13.5 feet.
14									13.5 to 20.0 feet: SAND (SW); brown, 90% sand, fine to coarse, subrounded, poorly sorted; 5% gravel, fine to medium, subrounded to rounded; 5% fines; micaceous; moist.
15									
16			90%	GP		GP7-S-15.5 PID = 5.6 ppm			@ 15.5 feet: Collected soil sample GP7-S-15.5. @ 16.0 feet: 1.5 feet layer of agglutinated sand, black.
17						PID = 7.7 ppm			
18									@ 18.0 feet: 2-inch layer of agglutinated sand, black.
19									@ 18.8 feet: 1-inch layer of agglutinated sand, black. @ 19.2 feet; 1-inch layer of agglutinated sand, black.
20									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	2 of 5

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
21			90%	GP					20.0 to 26.0 feet: GRAVELLY SAND (SW); brown; 75% sand, fine to coarse, subrounded; 20% gravel, fine to medium, subangular to subrounded; 5% fines; micaceous; moist.
22						PID = 2.8 ppm			
23									
24			75%	GP					
25						PID = 3.5 ppm			
26									26.0 to 29.0 feet: SAND (SW); grey; 95% sand, fine to coarse, subrounded, poorly sorted; 5% fines; micaceous; moist to wet. Trace gravel.
27									
28			100%	GP					
29									29.0 to 30.5 feet: SILT (ML); 85% fines, high plasticity; 15% sand, fine; micaceous; moist to very moist.
30						GP7-S-30.0 PID = 0.7 ppm			@ 30.0 feet: Collected soil sample GP7-S-30.0.
31									30.5 to 36.0 feet: SILTY SAND (SM); grey; 70-80% sand, fine to medium, subrounded; 20-30% fines, medium plasticity; micaceous; moist to very moist.
32			10%	GP					
33									
34		▽				PID = 0.0 ppm			
35									
36			100%	GP					36.0 to 37.0 feet: SANDY SILT (ML); grey; 70-80% fines, high plasticity; 20-30% sand, fine; micaceous; wet.
37									37.0 to 39.5 feet: SILTY SAND (SM); grey; 75% sand, fine to medium, subangular to subrounded; 25% fines, low plasticity; micaceous; wet.
38						PID = 0.0 ppm			
39									
40			80%	GP					39.5 to 40.0 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. 40.0 to 45.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
41									
42									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	3 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
43						PID = 0.7 ppm			
44									
45			100%	GP					45.0 to 46.0 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet. Trace organic debris.
46									46.0 to 47.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low to medium plasticity; micaceous; wet. Trace organic debris.
47									
48						PID = 0.7 ppm			47.5 to 49.0 feet: SANDY SILT (ML); dark grey; 80% fines, high plasticity; 20% sand, fine; micaceous; wet.
49									
50			75%	GP					49.0 to 49.4 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low to medium plasticity; micaceous; wet. Trace organic debris. 49.4 to 49.8 feet: SILT (ML); dark grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
51									49.8 to 50.0 feet: SILTY SAND (SM); dark grey; 85% sand, fine, subrounded; 15% fines, low plasticity; micaceous; wet. 50.0 to 60.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded to rounded, moderately sorted; 5% fines; micaceous; wet.
52									
53						PID = 0.0 ppm			
54									
55			80%	GP					
56									
57									
58									
59									
60			75%	GP					60.0 to 61.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
61									61.0 to 67.5 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet.
62									
63									
64									
65									

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

GBLWC W:\GINT\GINT\WPROJECTS\8128-01\GP4-7.GPJ 11/14/02

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	4 of 5

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data: Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
			100%	GP					
66									
67									
68						PID = 0.0 ppm			67.5 to 68.5 feet: SILT (ML); grey; 85% fines, high plasticity; 15% sand, fine; micaceous; wet.
69									68.5 to 69.0 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet. 69.0 to 71.0 feet: SAND WITH SILT (SP-SM); dark grey; 85% sand, fine to medium, subrounded; 15% fines, low plasticity; micaceous; wet.
70			100%	GP					
71									71.0 to 79.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
72									
73						PID = 0.0 ppm			
74									
75			100%	GP					
76				GW					
77									
78						PID = 0.7 ppm GP7-W-78.0			@ 78.0 feet: Collected water sample GP7-W-78.0. Screened from 76.0 to 80.0 feet bgs.
79									
80			90%	GP					79.5 to 80.0 feet: SILTY SAND (SM); dark grey; 80% sand, fine to medium, subrounded; 20% fines, low plasticity; micaceous; wet. 80.0 to 85.0 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
81									
82									
83						PID = 0.7 ppm			
84									
85			100%	GP					85.0 to 87.0 feet: SANDY SILT (ML); dark grey; 75 to 85% fines, medium to high plasticity; 15 to 25% sand, fine; micaceous; wet.
86									
87									87.0 to 88.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10%

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

GBLWC W:\GINT\GINTW\PROJECTS\B128-01\GP4-7.GPJ 11/14/02

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
8128.01.04	GP7	5 of 5

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
88						PID = 3.1 ppm			sand, fine; micaceous; wet.
									88.0 to 89.0 feet: SANDY SILT (ML); grey; 80% fines, low to medium plasticity; 20% sand, fine; micaceous; wet. Silt nodules 1/4-inch diameter.
89									89.0 to 91.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subangular, moderately sorted; 5% fines; micaceous; wet.
90			100%	GP					
91									
92									91.5 to 92.5 feet: SANDY SILT (ML); dark grey; 75% fines, high plasticity; 25% sand, fine to medium, subangular; micaceous; wet.
93						PID = 6.2 ppm			92.5 to 94.5 feet: SAND (SP); dark grey; 95% sand, fine to medium, subrounded, moderately sorted; 5% fines; micaceous; wet.
94									
95			90%	GP					94.5 to 96.0 feet: SILT (ML); grey; 90% fines, high plasticity; 10% sand, fine; micaceous; wet.
96				GW					96.0 to 100.0 feet: SILTY SAND (SM); dark grey; 90% sand, fine to medium, subrounded; 10% fines, medium plasticity; micaceous; wet.
97									
98						PID = 7.8 ppm GP7-W-98.0			@ 97.4 feet: 1-inch silt lens @ 98.0 feet: 2-inch silt lens @ 98.0 feet: Collect water sample GP7-W-98.0. Screened from 96.0 to 100.0 feet bgs.
99									
100									

Total Depth = 100.0 feet below ground surface.

Borehole Completion Details

0.0 to 36.0 feet bgs: dual tube sampling system.
0.0 to 36.0 feet bgs: drive 3.25-inch temporary casing fitted with large drive shoe.
36.0 feet bgs: tremied in grout to set a seal on the 3.25-inch casing.
36.0 to 100.0 feet bgs: 2-inch by 5-foot long macro core soil sampler.
0.0 to 15.0 feet bgs: abandoned with 3/4-inch bentonite chips hydrated with potable water.
15.0 to 100.0 feet bgs: tremied in grout.

NOTES: 1.) N/A = not available. 2.) GP = Geo-Probe. 3.) PID = Photo ionization detector. Maximum PID reading observed from 4-foot polyethylene macro core sampler measured at 1 foot intervals through a hole drilled into the sampler sleeve. 4.) ppm = parts per million. 5.) bgs = below ground surface. 6.) GW = ground water sample, dashed graphic indicates screened interval.

▽ **Water level observed while drilling by wetness on drilling equipment.**

GBLWC W:\GINT\GINT\WPROJECTS\8128-01\GP4-7.GPJ 11/14/02

Columbia Analytical Services INC.
An Employee-Owned Company

November 5, 2002

Service Request No: K2206967

Dana Bayuk
Maul Foster & Alongi, Inc.
7223 N.E. Hazel Dell Avenue
Suite B
Vancouver, WA 98665

RE: Wacker/8128.01.04/3

Dear Dana:

Enclosed are the results of the sample(s) submitted to our laboratory on September 30, 2002. For your reference, these analyses have been assigned our service request number K2206967.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

Harvey Jacky
Project Chemist

HJ/dj

NELAC Accredited
1317 South 13th Avenue PO Box 479 Kelso Washington 98626
(360) 577-7222 (800) 695-7222x07 Fax (360) 636-1068
ACIL Seal of Excellence Laboratory

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Case Narrative

SCOEPA00011264

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Maul Foster & Alongi, Inc.	**Service Request No.:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Received:**	9/30/02
Sample Matrix:	Soil/Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

One water and three soil samples were received for analysis at Columbia Analytical Services on 9/30/02. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for Bromoform in ICAL ID CAL1969. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 7.2%. The calibration meets the alternative evaluation criteria.

The primary evaluation criterion was exceeded for the following analytes in ICAL ID CAL2067: Methylene Chloride, trans-1,3-Dichloropropene, 2-Hexanone, 1,2-Dibromo-3-chloropropane, and Naphthalene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 9.5%. The calibration meets the alternative evaluation criteria.

The CAS minimum relative response factor criterion for 4-Methyl-2-pentanone (MIBK) was not met in ICAL ID CAL2067. In accordance with CAS standard operating procedures, a Method Reporting Limit (MRL) check standard containing the analyte of concern was analyzed each day of analysis. The MRL check standard verifies instrument sensitivity was adequate to detect the analyte at the MRL on the day of analysis. Because the sensitivity was shown to be adequate to detect the compound in question, the data quality is not significantly affected. No further corrective action was appropriate.

Approved by _____ **Date** 10/24/02

Surrogate Exceptions:
The control criteria were exceeded for the 4-Bromofluorobenzene surrogates in MS KWG0207988-1 and DMS KWG0207988-2. The associated matrix spike recoveries of target compounds were in control, indicating the analysis was in control. The surrogate outlier is flagged accordingly. No further corrective action was appropriate.

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recovery of Naphthalene for sample GP4-S-7.5 is not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Laboratory Control Sample (LCS) Exceptions:
The advisory criterion was exceeded for the following analytes in LCS KWG0207885-7: Bromodichloromethane, Dibromomethane, and trans-1,3-Dichloropropene. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The upper control criterion was exceeded for the following analytes in LCS KWG0207756-3: Carbon Disulfide, Toluene and n-Butylbenzene. The analytes in question were not detected in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for the following analytes in ICAL ID CAL2040: 2,6-Dimethylnaphthalene, Acenaphthylene, 2,4,6-Tribromophenol, Pentachlorophenol, Anthracene, Carbazole, Fluoranthene, Benz(a)anthracene, Benzo(a)pyrene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 12.6%. The calibration meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria were exceeded for all surrogates in sample GP4-S-7.5 due to matrix interferences. Due to the presence of non-target background components that prevented adequate resolution of the surrogate, accurate quantitation was not possible. No further corrective action was appropriate.

Approved by _____ **Date** 10/24/02

Chain of Custody Documentation

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

SR#: K2206967

PAGE 1 OF 1 COC # 00008

PROJECT NAME: Wacker Siltronic, Corp.
PROJECT NUMBER: 8128.01.04/3
PROJECT MANAGER: Dana Bayuk, MFA
COMPANY/ADDRESS: 3121 SW Moody Ave, Ste 200
Portland, OR 972
PHONE #: 971.544.2139 FAX #: 971.544.2140
SAMPLER'S SIGNATURE: [signature]

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS PAHs 625 ☐ 8270 ☒ 5Zm	Volatile Organics 624 ☐ 8260 ☒ 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1 ☐ 418.1 ☐ 1664 SGT ☐ 1664 HEM ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	GC/MS-SIM PAH ☐ Phenol ☐ Phthalates ☐	Metals, Total or Dissolved (See list below)	Cyanide ☒ Hex-Chrom ☐	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle)	NH3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOX 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS
GP4-S-7.5	9/26/02	1127		Soil	2	X	X										X		per Dana						Impacted (?)
GP4-S-19.0	↓	1435		Soil	2	X	X										X								
GP4-S-26.0	↓	1625		Soil	2	X	X										X								
GP4-W-68.0	9/27/02	1300		Wtr	5	X	X										X								
Trip 1	—	—			2																				Hold

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
X II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION
P.O. # ___
Bill To: ___

TURNAROUND REQUIREMENTS
___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results
___ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg
Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:___ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
[signature]	9/30/02, 0800	[signature]	9/30/02				
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
Dana Bayuk	MFA	[signature]	CAS 1600				
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

SCOEPA00011268

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

CAS

Project/Client M F. Work Order K22 06967

Cooler received on 9/30/02 and opened on 9/30/02 by [illegible]

1.	Were custody seals on outside of cooler? If yes, how many and where? 1 F.					Y	N
2.	Were seals intact and signature & date correct?					Y	N
3.	COC #	___	___	___	___	___	
	Temperature of cooler(s) upon receipt:	0.6	___	___	___	___	
	Temperature Blank:	___	___	___	___	___	
4.	Were custody papers properly filled out (ink, signed, etc.)?					Y	N
5.	Type of packing material present ice packs. plastic						
6.	Did all bottles arrive in good condition (unbroken)?					Y	N
7.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?					Y	N
8.	Did all bottle labels and tags agree with custody papers?					Y	N
9.	Were the correct types of bottles used for the tests indicated?					Y	N
10.	Were all of the preserved bottles received at the lab with the appropriate pH?					Y	N
11.	Were VOA vials checked for absence of air bubbles, and if present, noted below?					Y	N
12.	Did the bottles originate from CAS/K or a branch laboratory?					Y	N
13.	Are CWA Microbiology samples received with > ½ the 24 hr. hold time remaining from collection?					~~Y~~	~~N~~
14.	Was CL2/Residual negative?					~~Y~~	~~N~~

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

00009

CRFREV.DOC12/24/01

SCOEPA00011269

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: WET

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
GP4-S-7.5	K2206967-001	09/26/2002	09/30/2002	10/03/2002	85.2	
GP4-S-19.0	K2206967-002	09/26/2002	09/30/2002	10/03/2002	93.0	
GP4-S-26.0	K2206967-003	09/26/2002	09/30/2002	10/03/2002	95.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002
		Date Analyzed:	10/03/2002

Duplicate Sample Summary

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	WET
Test Notes:			

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
GP4-S-7.5	K2206967-001	85.2	89.5	87.4	5	

00012

General Chemistry Parameters

SCOEPA00011273

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/27/02
Sample Matrix:	Water	**Date Received:**	09/30/02

Cyanide, Total

Prep Method:	NONE	Units:	mg/L (ppm)
Analysis Method:	335.2	Basis:	NA
Test Notes:			

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
GP4-W-68.0	K2206967-004	0.01	1	NA	10/08/02	0.84	
Method Blank	K2206967-MB	0.01	1	NA	10/08/02	ND	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 11/1/02

1A/020597p

06967WET.EL1 - SAMPLE 11/01/02

SCOEPA00011274

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967
Date Collected: 9/27/02
Date Received: 9/30/02
Date Extracted: NA
Date Analyzed: 10/8/02

Duplicate Summary
Inorganic Parameters

Sample Name: GP4-W-68.0
Lab Code: K2206967-004DUP
Test Notes:

Units: mg/L (ppm)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Cyanide, Total	NONE	335.2	0.01	0.84	0.80	0.82	5	

Approved By: PL Date: 10/14/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	9/27/02
Sample Matrix:	Water	**Date Received:**	9/30/02
		Date Extracted:	NA
		Date Analyzed:	10/8/02

Matrix Spike Summary
Inorganic Parameters

Sample Name:	GP4-W-68.0	Units:	mg/L (ppm)
Lab Code:	K2206967-004MS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.01	0.10	0.84	0.92	77	75-125	

Approved By: _____ Date: 10/14/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/8/02

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name:	Lab Control Sample	Units:	mg/L (ppm)
Lab Code:	K2206967-LCS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.86	0.95	110	85-115	

00017

Approved By: [illegible] Date: 10/14/02

Volatile Organic Compounds
Method 8260

00018

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967
Date Collected: 09/27/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-W-68.0
Lab Code: K2206967-004

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Vinyl Chloride	**1.4**		0.50	1	10/10/02	10/10/02	KWG0207988	
Bromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Trichlorofluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Acetone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Disulfide	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methylene Chloride	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Butanone (MEK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
2,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
cis-1,2-Dichloroethene	**21**		0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Tetrachloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Benzene	**7.1**		0.50	1	10/10/02	10/10/02	KWG0207988	
Trichloroethene (TCE)	ND	U	0.20	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromodichloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Hexanone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Toluene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,2-Trichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	*

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/27/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-W-68.0	**Units:**	ug/L
Lab Code:	K2206967-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Tetrachloroethene (PCE)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Chlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Ethylbenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
m,p-Xylenes	**1.4**		0.50	1	10/10/02	10/10/02	KWG0207988	
o-Xylene	**0.63**		0.50	1	10/10/02	10/10/02	KWG0207988	
Styrene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromoform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Isopropylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
n-Propylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
2-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
4-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
tert-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
sec-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Isopropyltoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,4-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
n-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Naphthalene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Hexachlorobutadiene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/27/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-W-68.0	**Units:**	ug/L
Lab Code:	K2206967-004	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	78-124	10/10/02	Acceptable
Toluene-d8	107	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	106	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K2206967-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Vinyl Chloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Trichlorofluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Acetone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Disulfide	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methylene Chloride	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Butanone (MEK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
2,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Tetrachloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Benzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Trichloroethene (TCE)	ND	U	0.20	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromodichloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Hexanone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Toluene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,2-Trichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	*

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K2206967-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Tetrachloroethene (PCE)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Chlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Ethylbenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
m,p-Xylenes	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
o-Xylene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Styrene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromoform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Isopropylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
n-Propylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
2-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
4-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
tert-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
sec-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Isopropyltoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,4-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
n-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Naphthalene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Hexachlorobutadiene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	

* See Case Narrative

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	Trip Blank	**Units:**	ug/L
Lab Code:	K2206967-005	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	78-124	10/10/02	Acceptable
Toluene-d8	105	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	105	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207988-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Vinyl Chloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Trichlorofluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Acetone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Disulfide	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Methylene Chloride	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Butanone (MEK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
2,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Chloroform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Carbon Tetrachloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Benzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Trichloroethene (TCE)	ND	U	0.20	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromodichloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
2-Hexanone	ND	U	20	1	10/10/02	10/10/02	KWG0207988	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Toluene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,2-Trichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/10/02	10/10/02	KWG0207988	*

Comments:

00025

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0207988-4

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Tetrachloroethene (PCE)	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Dibromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Chlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Ethylbenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
m,p-Xylenes	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
o-Xylene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Styrene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromoform	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Isopropylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
Bromobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
n-Propylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
2-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
4-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
tert-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
sec-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,3-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
4-Isopropyltoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,4-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
n-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0207988	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Naphthalene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	
Hexachlorobutadiene	ND	U	2.0	1	10/10/02	10/10/02	KWG0207988	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207988-4	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	78-124	10/10/02	Acceptable
Toluene-d8	105	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	105	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-S-7.5	**Units:**	mg/Kg
Lab Code:	K2206967-001	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Chloromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Vinyl Chloride	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Bromomethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Chloroethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Trichlorofluoromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Acetone	ND	U	590	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Methyl tert-Butyl Ether	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Carbon Disulfide	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Methylene Chloride	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
trans-1,2-Dichloroethene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
2-Butanone (MEK)	ND	U	590	1	10/04/02	10/05/02	KWG0207885	
2,2-Dichloropropane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
cis-1,2-Dichloroethene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Chloroform	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Bromochloromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,1,1-Trichloroethane (TCA)	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloropropene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Carbon Tetrachloride	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichloroethane (EDC)	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Benzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Trichloroethene (TCE)	ND	U	1.2	1	10/04/02	10/23/02	KWG0207885	*
1,2-Dichloropropane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Bromodichloromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	*
Dibromomethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	*
2-Hexanone	ND	U	590	1	10/04/02	10/05/02	KWG0207885	
cis-1,3-Dichloropropene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Toluene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
trans-1,3-Dichloropropene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	*
1,1,2-Trichloroethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
4-Methyl-2-pentanone (MIBK)	ND	U	590	1	10/04/02	10/05/02	KWG0207885	

Comments:

00028

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: 09/26/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-S-7.5
Lab Code: K2206967-001

Units: mg/Kg
Basis: Dry

Extraction Method: EPA 5035/5030B
Analysis Method: 8260B

Level: Med

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Tetrachloroethene (PCE)	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Dibromochloromethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromoethane (EDB)	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
Chlorobenzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,1,1,2-Tetrachloroethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Ethylbenzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
m,p-Xylenes	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
o-Xylene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Styrene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Bromoform	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Isopropylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,1,2,2-Tetrachloroethane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichloropropane	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
Bromobenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
n-Propylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
2-Chlorotoluene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
4-Chlorotoluene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,3,5-Trimethylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
tert-Butylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trimethylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
sec-Butylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,3-Dichlorobenzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
4-Isopropyltoluene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,4-Dichlorobenzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
n-Butylbenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichlorobenzene	ND	U	15	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromo-3-chloropropane	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trichlorobenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichlorobenzene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	
Naphthalene	**1500**		120	1	10/04/02	10/07/02	KWG0207885	
Hexachlorobutadiene	ND	U	59	1	10/04/02	10/05/02	KWG0207885	

* See Case Narrative

Comments:

00029

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-S-7.5	**Units:**	mg/Kg
Lab Code:	K2206967-001	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	0	41-152	10/05/02	Outside Control Limits
Toluene-d8	0	32-166	10/05/02	Outside Control Limits
4-Bromofluorobenzene	0	40-153	10/05/02	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: 09/26/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-S-19.0
Lab Code: K2206967-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Acetone	**64**		54	1	10/03/02	10/03/02	KWG0207756	*
1,1-Dichloroethene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	11	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	2.2	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	22	1	10/03/02	10/03/02	KWG0207756	

Comments:

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: 09/26/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-S-19.0
Lab Code: K2206967-002

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Tetrachloroethene (PCE)	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Dibromochloromethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromoethane (EDB)	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
Chlorobenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,1,1,2-Tetrachloroethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Ethylbenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
m,p-Xylenes	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
o-Xylene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Styrene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Bromoform	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Isopropylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,1,2,2-Tetrachloroethane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichloropropane	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
Bromobenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
n-Propylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
2-Chlorotoluene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
4-Chlorotoluene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,3,5-Trimethylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
tert-Butylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trimethylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
sec-Butylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichlorobenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
4-Isopropyltoluene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,4-Dichlorobenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
n-Butylbenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	*
1,2-Dichlorobenzene	ND	U	5.4	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromo-3-chloropropane	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trichlorobenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichlorobenzene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
Naphthalene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	
Hexachlorobutadiene	ND	U	22	1	10/03/02	10/03/02	KWG0207756	

* See Case Narrative

Comments:

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: 09/26/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-S-19.0
Lab Code: K2206967-002

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	105	84-121	10/03/02	Acceptable
Toluene-d8	108	80-125	10/03/02	Acceptable
4-Bromofluorobenzene	104	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-S-26.0	**Units:**	ug/Kg
Lab Code:	K2206967-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Acetone	ND	U	53	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	11	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	2.1	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: 09/26/2002
Date Received: 09/30/2002

Volatile Organic Compounds

Sample Name: GP4-S-26.0
Lab Code: K2206967-003

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Tetrachloroethene (PCE)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Dibromochloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromoethane (EDB)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Chlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,1,2-Tetrachloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Ethylbenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
m,p-Xylenes	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
o-Xylene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Styrene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromoform	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Isopropylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,1,2,2-Tetrachloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
n-Propylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
2-Chlorotoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
4-Chlorotoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,3,5-Trimethylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
tert-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trimethylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
sec-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
4-Isopropyltoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,4-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
n-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	*
1,2-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromo-3-chloropropane	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trichlorobenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichlorobenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Naphthalene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Hexachlorobutadiene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	

* See Case Narrative

Comments:

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Volatile Organic Compounds

Sample Name:	GP4-S-26.0	**Units:**	ug/Kg
Lab Code:	K2206967-003	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	105	84-121	10/03/02	Acceptable
Toluene-d8	104	80-125	10/03/02	Acceptable
4-Bromofluorobenzene	94	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0207756-4

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Acetone	ND	U	50	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	10	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	2.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0207756-4	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Tetrachloroethene (PCE)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Dibromochloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromoethane (EDB)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Chlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Ethylbenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
m,p-Xylenes	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
o-Xylene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Styrene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromoform	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Isopropylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
n-Propylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
2-Chlorotoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
4-Chlorotoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,3,5-Trimethylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
tert-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trimethylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
sec-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
4-Isopropyltoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,4-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
n-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	*
1,2-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trichlorobenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichlorobenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Naphthalene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Hexachlorobutadiene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	

* See Case Narrative

Comments:

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0207756-4	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	84-121	10/03/02	Acceptable
Toluene-d8	103	80-125	10/03/02	Acceptable
4-Bromofluorobenzene	95	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	mg/Kg
Lab Code:	KWG0207885-8	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Vinyl Chloride	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromomethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Trichlorofluoromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Acetone	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Methyl tert-Butyl Ether	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Carbon Disulfide	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Methylene Chloride	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
trans-1,2-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
2-Butanone (MEK)	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
2,2-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
cis-1,2-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloroform	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromochloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1,1-Trichloroethane (TCA)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Carbon Tetrachloride	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichloroethane (EDC)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Benzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Trichloroethene (TCE)	ND	U	0.020	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromodichloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
Dibromomethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
2-Hexanone	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
cis-1,3-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Toluene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
trans-1,3-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
1,1,2-Trichloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
4-Methyl-2-pentanone (MIBK)	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0207885-8

Units: mg/Kg
Basis: Dry

Extraction Method: EPA 5035/5030B
Analysis Method: 8260B

Level: Med

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
1,3-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Tetrachloroethene (PCE)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Dibromochloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromoethane (EDB)	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Chlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1,1,2-Tetrachloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Ethylbenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
m,p-Xylenes	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
o-Xylene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Styrene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromoform	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Isopropylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,1,2,2-Tetrachloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
n-Propylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
2-Chlorotoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
4-Chlorotoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,3,5-Trimethylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
tert-Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trimethylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
sec-Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,3-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
4-Isopropyltoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,4-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
n-Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromo-3-chloropropane	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trichlorobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichlorobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Naphthalene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Hexachlorobutadiene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	mg/Kg
Lab Code:	KWG0207885-8	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	79	41-152	10/05/02	Acceptable
Toluene-d8	85	32-166	10/05/02	Acceptable
4-Bromofluorobenzene	81	40-153	10/05/02	Acceptable

Comments:

00042

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	
GP4-W-68.0	K2206967-004	100	107	106	
Trip Blank	K2206967-005	101	105	105	
Method Blank	KWG0207988-4	101	105	105	
Batch QC	K2207128-006	104	105	106	
Batch QCMS	KWG0207988-1	103	111	114	*
Batch QCDMS	KWG0207988-2	103	111	118	*
Lab Control Sample	KWG0207988-3	102	110	106	

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	78-124
Sur2 =	Toluene-d8	87-118
Sur3 =	4-Bromofluorobenzene	81-113

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP4-S-19.0	K2206967-002	105	108	104
GP4-S-26.0	K2206967-003	105	104	94
Method Blank	KWG0207756-4	100	103	95
Lab Control Sample	KWG0207756-3	104	106	98

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	84-121
Sur2 =	Toluene-d8	80-125
Sur3 =	4-Bromofluorobenzene	80-123

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00044

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5035/5030B
Analysis Method: 8260B

Units: PERCENT
Level: Med

Sample Name	Lab Code	Sur1		Sur2		Sur3	
GP4-S-7.5	K2206967-001	0	#	0	#	0	#
Method Blank	KWG0207885-8	79		85		81	
GP4-S-7.5MS	KWG0207885-5	0	#	0	#	0	#
GP4-S-7.5DMS	KWG0207885-6	0	#	0	#	0	#
Lab Control Sample	KWG0207885-7	76		80		78	

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	41-152
Sur2 =	Toluene-d8	32-166
Sur3 =	4-Bromofluorobenzene	40-153

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00045

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/10/2002
Sample Matrix:	Water	**Date Analyzed:**	10/10/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2207128-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG0207988

		Batch QCMS KWG0207988-1 Matrix Spike			Batch QCDMS KWG0207988-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,1-Dichloroethene	ND	2460	2500	98	2530	2500	101	67-157	3	30
Benzene	ND	2460	2500	98	2510	2500	101	76-138	2	30
Trichloroethene (TCE)	5200	7370	2500	87	7350	2500	86	66-149	0	30
Toluene	ND	2520	2500	101	2570	2500	103	82-131	2	30
Chlorobenzene	ND	2370	2500	95	2420	2500	97	70-131	2	30
1,2-Dichlorobenzene	ND	2370	2500	95	2420	2500	97	70-126	2	30
Naphthalene	ND	2530	2500	101	2550	2500	102	50-149	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00046

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/04/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/05/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	GP4-S-7.5	**Units:**	mg/Kg
Lab Code:	K2206967-001	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	8260B	**Extraction Lot:**	KWG0207885

		GP4-S-7.5MS KWG0207885-5 Matrix Spike			GP4-S-7.5DMS KWG0207885-6 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,1-Dichloroethene	ND	281	292	96	278	292	95	51-127	1	40
Benzene	ND	283	292	97	282	292	96	57-121	1	40
Trichloroethene (TCE)	ND	317	292	108	317	292	108	45-127	0	40
Toluene	ND	283	292	97	276	292	94	34-134	3	40
Chlorobenzene	ND	307	292	105	312	292	107	37-126	1	40
1,2-Dichlorobenzene	ND	283	292	97	291	292	99	34-131	3	40
Naphthalene	1500	1640E	292	55 #	1850E	292	125 #	20-139	12	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00047

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/09/2002
Sample Matrix:	Water	**Date Analyzed:**	10/09/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0207988

	Lab Control Sample KWG0207988-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Dichlorodifluoromethane	13.5	10.0	135	33-189
Chloromethane	8.84	10.0	88	66-128
Vinyl Chloride	10.1	10.0	101	76-135
Bromomethane	10.6	10.0	106	30-188
Chloroethane	9.69	10.0	97	79-131
Trichlorofluoromethane	10.4	10.0	104	73-127
Acetone	59.3	50.0	119	60-157
1,1-Dichloroethene	9.71	10.0	97	79-137
Methyl tert-Butyl Ether	9.66	10.0	97	78-128
Carbon Disulfide	18.1	20.0	91	68-118
Methylene Chloride	8.88	10.0	89	68-135
trans-1,2-Dichloroethene	9.46	10.0	95	88-127
1,1-Dichloroethane	9.99	10.0	100	89-133
2-Butanone (MEK)	64.9	50.0	130	78-144
2,2-Dichloropropane	9.91	10.0	99	71-138
cis-1,2-Dichloroethene	9.77	10.0	98	90-126
Chloroform	10.1	10.0	101	88-117
Bromochloromethane	9.75	10.0	98	80-133
1,1,1-Trichloroethane (TCA)	10.5	10.0	105	83-122
1,1-Dichloropropene	10.2	10.0	102	87-137
Carbon Tetrachloride	11.2	10.0	112	87-131
1,2-Dichloroethane (EDC)	11.0	10.0	110	73-130
Benzene	9.86	10.0	99	90-120
Trichloroethene (TCE)	11.2	10.0	112	83-131
1,2-Dichloropropane	9.38	10.0	94	87-121
Bromodichloromethane	10.0	10.0	100	84-114
Dibromomethane	9.65	10.0	97	76-130
2-Hexanone	59.6	50.0	119	68-135
cis-1,3-Dichloropropene	10.8	10.0	108	90-126
Toluene	10.0	10.0	100	89-119
trans-1,3-Dichloropropene	9.76	10.0	98	77-113
1,1,2-Trichloroethane	9.13	10.0	91	81-116
4-Methyl-2-pentanone (MIBK)	66.8	50.0	134	79-138
1,3-Dichloropropane	9.89	10.0	99	76-129
Tetrachloroethene (PCE)	9.72	10.0	97	82-123

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00048

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967
Date Extracted: 10/09/2002
Date Analyzed: 10/09/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0207988

Analyte Name	Lab Control Sample KWG0207988-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dibromochloromethane	9.57	10.0	96	83-119
1,2-Dibromoethane (EDB)	9.32	10.0	93	74-130
Chlorobenzene	9.37	10.0	94	86-115
1,1,1,2-Tetrachloroethane	10.1	10.0	101	88-118
Ethylbenzene	9.79	10.0	98	89-124
m,p-Xylenes	19.5	20.0	98	90-122
o-Xylene	10.5	10.0	105	88-126
Styrene	10.6	10.0	106	91-123
Bromoform	10.0	10.0	100	76-125
Isopropylbenzene	9.42	10.0	94	82-123
1,1,2,2-Tetrachloroethane	8.15	10.0	82	78-117
1,2,3-Trichloropropane	10.0	10.0	100	75-127
Bromobenzene	9.69	10.0	97	76-129
n-Propylbenzene	10.0	10.0	100	83-128
2-Chlorotoluene	10.2	10.0	102	74-131
4-Chlorotoluene	10.1	10.0	101	87-119
1,3,5-Trimethylbenzene	10.8	10.0	108	85-128
tert-Butylbenzene	10.5	10.0	105	83-129
1,2,4-Trimethylbenzene	11.1	10.0	111	88-129
sec-Butylbenzene	9.98	10.0	100	84-133
1,3-Dichlorobenzene	9.96	10.0	100	87-116
4-Isopropyltoluene	10.3	10.0	103	81-126
1,4-Dichlorobenzene	9.43	10.0	94	86-115
n-Butylbenzene	10.1	10.0	101	79-134
1,2-Dichlorobenzene	9.51	10.0	95	85-113
1,2-Dibromo-3-chloropropane	7.35	10.0	74	55-136
1,2,4-Trichlorobenzene	10.1	10.0	101	76-130
1,2,3-Trichlorobenzene	9.69	10.0	97	70-134
Naphthalene	10.2	10.0	102	71-137
Hexachlorobutadiene	9.04	10.0	90	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00049

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Extracted: 10/03/2002
Date Analyzed: 10/03/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0207756

Analyte Name	Lab Control Sample KWG0207756-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dichlorodifluoromethane	51.1	50.0	102	46-130
Chloromethane	48.8	50.0	98	55-118
Vinyl Chloride	58.5	50.0	117	64-137
Bromomethane	64.8	50.0	130	58-147
Chloroethane	54.9	50.0	110	60-137
Trichlorofluoromethane	54.6	50.0	109	58-125
Acetone	195	250	78	59-111
1,1-Dichloroethene	55.7	50.0	111	76-135
Methyl tert-Butyl Ether	48.3	50.0	97	71-143
Carbon Disulfide	110	100	110 *	70-101
Methylene Chloride	55.2	50.0	110	76-117
trans-1,2-Dichloroethene	56.4	50.0	113	77-132
1,1-Dichloroethane	60.7	50.0	121	84-122
2-Butanone (MEK)	201	250	80	76-133
2,2-Dichloropropane	54.6	50.0	109	74-134
cis-1,2-Dichloroethene	55.3	50.0	111	79-123
Chloroform	57.4	50.0	115	74-122
Bromochloromethane	57.5	50.0	115	77-131
1,1,1-Trichloroethane (TCA)	54.0	50.0	108	66-137
1,1-Dichloropropene	55.6	50.0	111	81-130
Carbon Tetrachloride	55.0	50.0	110	70-142
1,2-Dichloroethane (EDC)	51.1	50.0	102	67-132
Benzene	55.9	50.0	112	84-115
Trichloroethene (TCE)	56.1	50.0	112	78-128
1,2-Dichloropropane	50.0	50.0	100	84-114
Bromodichloromethane	49.7	50.0	99	72-120
Dibromomethane	51.2	50.0	102	75-124
2-Hexanone	207	250	83	75-125
cis-1,3-Dichloropropene	52.9	50.0	106	88-122
Toluene	60.0	50.0	120 *	80-119
trans-1,3-Dichloropropene	44.6	50.0	89	73-116
1,1,2-Trichloroethane	46.6	50.0	93	76-115
4-Methyl-2-pentanone (MIBK)	231	250	92	78-122
1,3-Dichloropropane	45.5	50.0	91	74-111
Tetrachloroethene (PCE)	56.1	50.0	112	71-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00050

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Extracted: 10/03/2002
Date Analyzed: 10/03/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0207756

Analyte Name	Lab Control Sample KWG0207756-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dibromochloromethane	44.3	50.0	89	79-121
1,2-Dibromoethane (EDB)	47.4	50.0	95	80-121
Chlorobenzene	54.2	50.0	108	77-117
1,1,1,2-Tetrachloroethane	50.0	50.0	100	77-126
Ethylbenzene	55.2	50.0	110	78-125
m,p-Xylenes	109	100	109	74-122
o-Xylene	58.2	50.0	116	76-123
Styrene	58.1	50.0	116	78-127
Bromoform	47.6	50.0	95	75-139
Isopropylbenzene	54.2	50.0	108	71-123
1,1,2,2-Tetrachloroethane	43.9	50.0	88	72-120
1,2,3-Trichloropropane	52.7	50.0	105	73-133
Bromobenzene	57.2	50.0	114	69-132
n-Propylbenzene	61.4	50.0	123	70-123
2-Chlorotoluene	57.6	50.0	115	69-123
4-Chlorotoluene	59.4	50.0	119	70-123
1,3,5-Trimethylbenzene	57.3	50.0	115	70-127
tert-Butylbenzene	51.9	50.0	104	69-127
1,2,4-Trimethylbenzene	56.6	50.0	113	73-138
sec-Butylbenzene	62.1	50.0	124	70-129
1,3-Dichlorobenzene	58.2	50.0	116	72-122
4-Isopropyltoluene	57.3	50.0	115	71-119
1,4-Dichlorobenzene	59.4	50.0	119	74-119
n-Butylbenzene	61.6	50.0	123 *	69-120
1,2-Dichlorobenzene	56.2	50.0	112	72-121
1,2-Dibromo-3-chloropropane	52.5	50.0	105	71-125
1,2,4-Trichlorobenzene	63.9	50.0	128	68-130
1,2,3-Trichlorobenzene	59.9	50.0	120	70-127
Naphthalene	52.6	50.0	105	74-127
Hexachlorobutadiene	64.5	50.0	129	60-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00051

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/04/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/05/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5035/5030B	**Units:**	mg/Kg
Analysis Method:	8260B	**Basis:**	Dry
		Level:	Med
		Extraction Lot:	KWG0207885

	Lab Control Sample KWG0207885-7 Lab Control Spike				
Analyte Name	**Result**	**Expected**	**%Rec**		**%Rec Limits**
Dichlorodifluoromethane	0.992	1.00	99		10-145
Chloromethane	0.824	1.00	82		51-120
Vinyl Chloride	0.916	1.00	92		51-154
Bromomethane	0.260	1.00	26		10-115
Chloroethane	0.782	1.00	78		29-141
Trichlorofluoromethane	0.756	1.00	76		53-141
Acetone	3.52	5.00	70		61-152
1,1-Dichloroethene	0.793	1.00	79		68-145
Methyl tert-Butyl Ether	0.686	1.00	69		50-150
Carbon Disulfide	1.57	2.00	79		58-133
Methylene Chloride	0.777	1.00	78		77-127
trans-1,2-Dichloroethene	0.790	1.00	79		76-138
1,1-Dichloroethane	0.823	1.00	82		82-134
2-Butanone (MEK)	4.20	5.00	84		60-148
2,2-Dichloropropane	0.655	1.00	66		50-152
cis-1,2-Dichloroethene	0.818	1.00	82		49-158
Chloroform	0.797	1.00	80		77-135
Bromochloromethane	0.876	1.00	88		76-134
1,1,1-Trichloroethane (TCA)	0.750	1.00	75		68-139
1,1-Dichloropropene	0.795	1.00	80		68-140
Carbon Tetrachloride	0.777	1.00	78		63-147
1,2-Dichloroethane (EDC)	0.769	1.00	77		70-141
Benzene	0.818	1.00	82		66-136
Trichloroethene (TCE)	0.898	1.00	90		77-146
1,2-Dichloropropane	0.791	1.00	79		78-136
Bromodichloromethane	0.700	1.00	70	*	76-128
Dibromomethane	0.761	1.00	76	*	77-128
2-Hexanone	4.22	5.00	84		52-152
cis-1,3-Dichloropropene	0.749	1.00	75		74-135
Toluene	0.824	1.00	82		77-130
trans-1,3-Dichloropropene	0.692	1.00	69	*	71-134
1,1,2-Trichloroethane	0.844	1.00	84		76-134
4-Methyl-2-pentanone (MIBK)	4.30	5.00	86		57-138
1,3-Dichloropropane	0.845	1.00	85		77-127
Tetrachloroethene (PCE)	0.926	1.00	93		71-136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00052

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Extracted: 10/04/2002
Date Analyzed: 10/05/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5035/5030B
Analysis Method: 8260B

Units: mg/Kg
Basis: Dry
Level: Med
Extraction Lot: KWG0207885

Analyte Name	Lab Control Sample KWG0207885-7 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dibromochloromethane	0.828	1.00	83	67-137
1,2-Dibromoethane (EDB)	0.842	1.00	84	73-135
Chlorobenzene	0.911	1.00	91	78-132
1,1,1,2-Tetrachloroethane	0.914	1.00	91	69-143
Ethylbenzene	0.909	1.00	91	74-136
m,p-Xylenes	1.81	2.00	90	78-136
o-Xylene	0.906	1.00	91	78-134
Styrene	0.905	1.00	91	76-138
Bromoform	0.872	1.00	87	60-140
Isopropylbenzene	0.843	1.00	84	73-134
1,1,2,2-Tetrachloroethane	0.718	1.00	72	59-142
1,2,3-Trichloropropane	0.827	1.00	83	69-141
Bromobenzene	0.895	1.00	90	73-137
n-Propylbenzene	0.813	1.00	81	77-133
2-Chlorotoluene	0.808	1.00	81	71-138
4-Chlorotoluene	0.795	1.00	80	76-135
1,3,5-Trimethylbenzene	0.832	1.00	83	74-142
tert-Butylbenzene	0.861	1.00	86	70-142
1,2,4-Trimethylbenzene	0.837	1.00	84	76-146
sec-Butylbenzene	0.838	1.00	84	72-142
1,3-Dichlorobenzene	0.825	1.00	83	73-143
4-Isopropyltoluene	0.804	1.00	80	70-137
1,4-Dichlorobenzene	0.839	1.00	84	74-136
n-Butylbenzene	0.718	1.00	72	72-140
1,2-Dichlorobenzene	0.842	1.00	84	75-135
1,2-Dibromo-3-chloropropane	0.762	1.00	76	59-143
1,2,4-Trichlorobenzene	0.818	1.00	82	67-144
1,2,3-Trichlorobenzene	0.913	1.00	91	63-155
Naphthalene	0.807	1.00	81	61-155
Hexachlorobutadiene	0.898	1.00	90	58-152

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00053

Polynuclear Aromatic Hydrocarbons
Method 8270

00054

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/27/2002
Sample Matrix:	Water	**Date Received:**	09/30/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-W-68.0	**Units:**	ug/L
Lab Code:	K2206967-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.20**		0.020	1	10/03/02	10/15/02	KWG0207716	
2-Methylnaphthalene	**0.16**		0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthylene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthene	**0.050**		0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenzofuran	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Fluorene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Phenanthrene	**0.13**		0.020	1	10/03/02	10/15/02	KWG0207716	
Anthracene	**0.025**		0.020	1	10/03/02	10/15/02	KWG0207716	
Fluoranthene	**0.098**		0.020	1	10/03/02	10/15/02	KWG0207716	
Pyrene	**0.11**		0.020	1	10/03/02	10/15/02	KWG0207716	
Benz(a)anthracene	**0.030**		0.020	1	10/03/02	10/15/02	KWG0207716	
Chrysene	**0.034**		0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(b)fluoranthene	**0.024**		0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(k)fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(a)pyrene	**0.032**		0.020	1	10/03/02	10/15/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	**0.023**		0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(g,h,i)perylene	**0.023**		0.020	1	10/03/02	10/15/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	63	43-96	10/15/02	Acceptable
Fluoranthene-d10	83	20-131	10/15/02	Acceptable
Terphenyl-d14	76	13-146	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207716-4	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
2-Methylnaphthalene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthylene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenzofuran	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Fluorene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Phenanthrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benz(a)anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Chrysene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(b)fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(k)fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(a)pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	45	43-96	10/15/02	Acceptable
Fluoranthene-d10	68	20-131	10/15/02	Acceptable
Terphenyl-d14	79	13-146	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-S-7.5	**Units:**	ug/Kg
Lab Code:	K2206967-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**140000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
2-Methylnaphthalene	**82000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Acenaphthylene	**12000**	D	300	10	10/09/02	10/15/02	KWG0207967	
Acenaphthene	**120000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Dibenzofuran	**9200**	D	300	10	10/09/02	10/15/02	KWG0207967	
Fluorene	**77000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Phenanthrene	**420000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Anthracene	**110000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Fluoranthene	**250000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Pyrene	**290000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Benz(a)anthracene	**72000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Chrysene	**79000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Benzo(b)fluoranthene	**45000**	D	300	10	10/09/02	10/15/02	KWG0207967	
Benzo(k)fluoranthene	**45000**	D	300	10	10/09/02	10/15/02	KWG0207967	
Benzo(a)pyrene	**78000**	D	5900	200	10/09/02	10/15/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	**48000**	D	300	10	10/09/02	10/15/02	KWG0207967	
Dibenz(a,h)anthracene	**5700**	D	300	10	10/09/02	10/15/02	KWG0207967	
Benzo(g,h,i)perylene	**47000**	D	300	10	10/09/02	10/15/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	227	43-98	10/15/02	Outside Control Limits
Fluoranthene-d10	347	52-108	10/15/02	Outside Control Limits
Terphenyl-d14	172	61-122	10/15/02	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-S-19.0	**Units:**	ug/Kg
Lab Code:	K2206967-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**20**		5.4	1	10/09/02	10/11/02	KWG0207967	
2-Methylnaphthalene	**6.7**		5.4	1	10/09/02	10/11/02	KWG0207967	
Acenaphthylene	**26**		5.4	1	10/09/02	10/11/02	KWG0207967	
Acenaphthene	**6.4**		5.4	1	10/09/02	10/11/02	KWG0207967	
Dibenzofuran	ND	U	5.4	1	10/09/02	10/11/02	KWG0207967	
Fluorene	**18**		5.4	1	10/09/02	10/11/02	KWG0207967	
Phenanthrene	**150**		5.4	1	10/09/02	10/11/02	KWG0207967	
Anthracene	**36**		5.4	1	10/09/02	10/11/02	KWG0207967	
Fluoranthene	**270**		5.4	1	10/09/02	10/11/02	KWG0207967	
Pyrene	**430**		5.4	1	10/09/02	10/11/02	KWG0207967	
Benz(a)anthracene	**120**		5.4	1	10/09/02	10/11/02	KWG0207967	
Chrysene	**150**		5.4	1	10/09/02	10/11/02	KWG0207967	
Benzo(b)fluoranthene	**120**		5.4	1	10/09/02	10/11/02	KWG0207967	
Benzo(k)fluoranthene	**99**		5.4	1	10/09/02	10/11/02	KWG0207967	
Benzo(a)pyrene	**170**		5.4	1	10/09/02	10/11/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	**140**		5.4	1	10/09/02	10/11/02	KWG0207967	
Dibenz(a,h)anthracene	**16**		5.4	1	10/09/02	10/11/02	KWG0207967	
Benzo(g,h,i)perylene	**160**		5.4	1	10/09/02	10/11/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	43-98	10/11/02	Acceptable
Fluoranthene-d10	93	52-108	10/11/02	Acceptable
Terphenyl-d14	99	61-122	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/26/2002
Sample Matrix:	Soil	**Date Received:**	09/30/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-S-26.0	**Units:**	ug/Kg
Lab Code:	K2206967-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
2-Methylnaphthalene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Acenaphthylene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Acenaphthene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Dibenzofuran	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Fluorene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Phenanthrene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Anthracene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Fluoranthene	**7.3**		5.3	1	10/09/02	10/11/02	KWG0207967	
Pyrene	**120**		5.3	1	10/09/02	10/11/02	KWG0207967	
Benz(a)anthracene	**6.8**		5.3	1	10/09/02	10/11/02	KWG0207967	
Chrysene	**13**		5.3	1	10/09/02	10/11/02	KWG0207967	
Benzo(b)fluoranthene	**11**		5.3	1	10/09/02	10/11/02	KWG0207967	
Benzo(k)fluoranthene	**11**		5.3	1	10/09/02	10/11/02	KWG0207967	
Benzo(a)pyrene	**13**		5.3	1	10/09/02	10/11/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	**10**		5.3	1	10/09/02	10/11/02	KWG0207967	
Dibenz(a,h)anthracene	ND	U	5.3	1	10/09/02	10/11/02	KWG0207967	
Benzo(g,h,i)perylene	**12**		5.3	1	10/09/02	10/11/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	43-98	10/11/02	Acceptable
Fluoranthene-d10	91	52-108	10/11/02	Acceptable
Terphenyl-d14	109	61-122	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0207967-6	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
2-Methylnaphthalene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Acenaphthylene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Acenaphthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Dibenzofuran	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Fluorene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Phenanthrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benz(a)anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Chrysene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(b)fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(k)fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(a)pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Dibenz(a,h)anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(g,h,i)perylene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	43-98	10/11/02	Acceptable
Fluoranthene-d10	82	52-108	10/11/02	Acceptable
Terphenyl-d14	102	61-122	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2206967

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP4-W-68.0	K2206967-004	63	83	76
Method Blank	KWG0207716-4	45	68	79
Batch QC	K2206980-010	75	79	79
Batch QCMS	KWG0207716-1	76	86	87
Batch QCDMS	KWG0207716-2	72	85	85
Lab Control Sample	KWG0207716-3	74	93	89

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-96
Sur2 =	Fluoranthene-d10	20-131
Sur3 =	Terphenyl-d14	13-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP4-S-7.5	K2206967-001	227 D *	347 D *	172 D *
GP4-S-19.0	K2206967-002	73	93	99
GP4-S-26.0	K2206967-003	76	91	109
Method Blank	KWG0207967-6	72	82	102
GP4-S-26.0MS	KWG0207967-1	71	84	90
GP4-S-26.0DMS	KWG0207967-2	70	86	95
Lab Control Sample	KWG0207967-5	68	79	89
Duplicate Lab Control Sample	KWG0207967-8	71	82	94

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-98
Sur2 =	Fluoranthene-d10	52-108
Sur3 =	Terphenyl-d14	61-122

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/03/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2206980-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207716

Analyte Name	Sample Result	Batch QCMS KWG0207716-1 Matrix Spike			Batch QCDMS KWG0207716-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	15	19.6	10.0	44	20.1E	10.0	49	30-97	3	30
2-Methylnaphthalene	19	23.9E	10.0	49	24.4E	10.0	54	33-96	2	30
Acenaphthylene	ND	7.92	10.0	79	8.01	10.0	80	39-104	1	30
Acenaphthene	0.45	7.13	10.0	67	7.29	10.0	68	34-99	2	30
Dibenzofuran	0.27	7.11	10.0	68	7.34	10.0	71	16-110	3	30
Fluorene	0.91	8.05	10.0	71	8.27	10.0	74	36-105	3	30
Phenanthrene	0.33	7.47	10.0	71	7.77	10.0	74	31-106	4	30
Anthracene	ND	8.08	10.0	81	8.23	10.0	82	24-111	2	30
Fluoranthene	ND	7.86	10.0	79	8.31	10.0	83	16-121	6	30
Pyrene	ND	8.24	10.0	82	8.80	10.0	88	11-125	6	30
Benz(a)anthracene	ND	8.52	10.0	85	8.97	10.0	90	14-125	5	30
Chrysene	ND	7.45	10.0	75	7.92	10.0	79	16-117	6	30
Benzo(b)fluoranthene	ND	7.98	10.0	80	8.77	10.0	88	16-124	9	30
Benzo(k)fluoranthene	ND	7.33	10.0	73	8.08	10.0	81	14-127	10	30
Benzo(a)pyrene	ND	9.22	10.0	92	9.66	10.0	97	19-126	5	30
Indeno(1,2,3-cd)pyrene	ND	8.52	10.0	85	8.53	10.0	85	10-137	0	30
Dibenz(a,h)anthracene	ND	7.69	10.0	77	7.78	10.0	78	16-124	1	30
Benzo(g,h,i)perylene	ND	7.49	10.0	75	7.56	10.0	76	15-119	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/09/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/11/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-S-26.0	**Units:**	ug/Kg
Lab Code:	K2206967-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207967

		GP4-S-26.0MS KWG0207967-1 Matrix Spike			GP4-S-26.0DMS KWG0207967-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	ND	182	263	69	174	263	66	19-105	4	40
2-Methylnaphthalene	ND	188	263	72	180	263	68	36-95	5	40
Acenaphthylene	ND	211	263	80	199	263	76	40-99	5	40
Acenaphthene	ND	198	263	75	191	263	73	33-102	4	40
Dibenzofuran	ND	201	263	76	192	263	73	38-100	5	40
Fluorene	ND	210	263	80	200	263	76	38-103	5	40
Phenanthrene	ND	219	263	83	217	263	83	33-113	1	40
Anthracene	ND	247	263	94	242	263	92	40-114	2	40
Fluoranthene	7.3	254	263	94	274	263	102	41-117	8	40
Pyrene	120	347	263	86	379	263	99	26-139	9	40
Benz(a)anthracene	6.8	276	263	103	282	263	105	32-134	2	40
Chrysene	13	255	263	92	265	263	96	27-135	4	40
Benzo(b)fluoranthene	11	296	263	108	316	263	116	31-136	7	40
Benzo(k)fluoranthene	11	265	263	96	287	263	105	32-131	8	40
Benzo(a)pyrene	13	320	263	117	337	263	123	26-146	5	40
Indeno(1,2,3-cd)pyrene	10	276	263	101	281	263	103	33-133	2	40
Dibenz(a,h)anthracene	ND	236	263	90	234	263	89	42-114	1	40
Benzo(g,h,i)perylene	12	253	263	92	260	263	94	31-122	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00064

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2206967
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/03/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0207716

	Lab Control Sample KWG0207716-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	3.75	5.00	75	37-95
2-Methylnaphthalene	3.81	5.00	76	26-110
Acenaphthylene	4.37	5.00	87	44-103
Acenaphthene	3.90	5.00	78	41-97
Dibenzofuran	3.99	5.00	80	17-130
Fluorene	4.26	5.00	85	46-102
Phenanthrene	4.21	5.00	84	47-101
Anthracene	4.60	5.00	92	45-104
Fluoranthene	4.90	5.00	98	51-112
Pyrene	4.59	5.00	92	45-111
Benz(a)anthracene	5.10	5.00	102	50-111
Chrysene	4.53	5.00	91	51-108
Benzo(b)fluoranthene	4.89	5.00	98	54-114
Benzo(k)fluoranthene	4.35	5.00	87	51-117
Benzo(a)pyrene	5.27	5.00	105	51-119
Indeno(1,2,3-cd)pyrene	5.45	5.00	109	43-127
Dibenz(a,h)anthracene	4.96	5.00	99	47-119
Benzo(g,h,i)perylene	4.79	5.00	96	44-115

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2206967
Date Extracted: 10/09/2002
Date Analyzed: 10/11/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0207967

	Lab Control Sample KWG0207967-5 Lab Control Spike			Duplicate Lab Control Sample KWG0207967-8 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	158	249	63	165	249	66	33-98	5	40
2-Methylnaphthalene	163	249	65	173	249	70	36-103	6	40
Acenaphthylene	178	249	71	188	249	75	41-102	6	40
Acenaphthene	169	249	68	180	249	72	41-97	6	40
Dibenzofuran	174	249	70	183	249	74	38-102	5	40
Fluorene	183	249	74	192	249	77	43-101	4	40
Phenanthrene	195	249	78	200	249	80	45-101	2	40
Anthracene	218	249	87	227	249	91	46-109	4	40
Fluoranthene	218	249	88	229	249	92	49-112	5	40
Pyrene	234	249	94	247	249	99	50-112	5	40
Benz(a)anthracene	236	249	95	245	249	98	52-114	3	40
Chrysene	220	249	88	233	249	93	54-109	6	40
Benzo(b)fluoranthene	257	249	103	285	249	114	54-115	10	40
Benzo(k)fluoranthene	239	249	96	265	249	107	54-115	11	40
Benzo(a)pyrene	262	249	105	281	249	113	54-120	7	40
Indeno(1,2,3-cd)pyrene	232	249	93	243	249	98	49-121	5	40
Dibenz(a,h)anthracene	212	249	85	224	249	90	48-114	5	40
Benzo(g,h,i)perylene	215	249	86	231	249	93	45-113	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00066

Columbia Analytical Services INC.
An Employee-Owned Company

November 5, 2002

Service Request No: K2207046

Dana Bayuk
Maul Foster & Alongi, Inc.
7223 N.E. Hazel Dell Avenue
Suite B
Vancouver, WA 98665

RE: Wacker/8128.01.04/3

Dear Dana:

Enclosed are the results of the sample(s) submitted to our laboratory on October 2, 2002. For your reference, these analyses have been assigned our service request number K2207046.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

for

Harvey Jacky
Project Chemist

HJ/afs

NELAC Accredited

1317 South 13th Avenue PO Box 479 Kelso Washington 98626
(360) 577-7222 (800) 695-7222x07 Fax (360) 636-1068

ACIL Seal of Excellence Laboratory

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

SCOEPA00011330

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Maul Foster & Alongi, Inc.	**Service Request No.:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Received:**	10/2/02
Sample Matrix:	Soil/Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Matrix/Duplicate Matrix Spike (MS/DMS).

Sample Receipt

Three soil and four water samples were received for analysis at Columbia Analytical Services on 10/2/02. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for Bromoform in ICAL ID CAL1969. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 7.2%. The calibration meets the alternative evaluation criteria.

The primary evaluation criterion was exceeded for Bromomethane in ICAL ID CAL2058. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 8.1%. The calibration meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria for the following surrogates in sample Batch QC and Batch QCMS/DMS are not applicable: Dibromofluoromethane, Toluene-d8 and 4-Bromofluorobenzene. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recovery of Naphthalene for sample Batch QC is not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

Laboratory Control Sample (LCS) Exceptions:
The advisory criterion was exceeded for Methyl tert-Butyl Ether in LCS KWG0208091-3. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used

Approved by HC **Date** 11/4/02

to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The advisory criterion was exceeded for Bromodichloromethane, Dibromoethane and trans-1,3-Dichloropropene in LCS KWG0207885-7. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The upper control criterion was exceeded for Carbon Disulfide, Toluene and n-Butylbenzene in LCS KWG0207756-3. The analytes in question were not detected in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

Elevated Method Reporting Limits:
Samples GP6-W-98.0 and GP-Dup required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C SIM

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for the following analytes in ICAL ID CAL2040: 2,6-Dimethylnaphthalene, Acenaphthylene, 2,4,6-Tribromophenol, Pentachlorophenol, Anthracene, Carbazole, Fluoranthene, Benz(a)anthracene, Benzo(a)pyrene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 12.6%. The calibration meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria for all surrogates in sample GP6-S-23.0 are not applicable. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

Matrix Spike Recovery Exceptions:
The matrix spike recoveries of most analytes for sample GP6-@-15.0 were outside the CAS control criteria as a result of the heterogeneous character of the sample. The Relative Percent Difference (RPD) for the replicate analysis supports this. Since the unspiked samples contain high analyte concentrations relative to the amount spiked, the variability between replicates was sufficient to bias the percent recoveries outside normal CAS control criteria. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicate the analysis was in control. No further corrective action was appropriate.

Relative Percent Difference (RPD) Exceptions:
The matrix spike recoveries of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene for sample GP6-@-15.0 were outside the CAS control criteria as a result of the heterogeneous character of the sample. The RPD for the replicate analysis supports this. Since the unspiked samples contain high analyte concentrations relative to the amount spiked, the variability between replicates was sufficient to bias the percent recoveries outside normal CAS control criteria. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicate the analysis was in control. No further corrective action was appropriate.

Approved by HT **Date** 11/4/02

Chain of Custody Documentation

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

SR#: 1220-1046

PAGE 1 OF 1 COC # 80000

PROJECT NAME: Wacker
PROJECT NUMBER: 8128.01.04 /3
PROJECT MANAGER: Dana Baykk, MFA Inc.
COMPANY/ADDRESS: 7223 NE Hazel Dell Ave, Suite B
Vancouver, WA 98665
PHONE #: 360-694-2691
FAX #: 360-906-1958
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☒ PAHs SIM	Volatile Organics 624 ☐ 8260 ☒ 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1 ☐ 418.1 ☐ 1664 SGT ☐ 1664 HEM ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	GC/MS-SIM PAH ☐ Phenol ☐ Phthalates ☐	Metals, Total or Dissolved (See list below)	Cyanide ☒	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle) Hex-Chrom ☐	NH3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOC 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS
GP6-S-15.0	9/30/02	15:33		soil	2	X	X										X								
GP6-S-23.0	9/30/02	15:57		soil	2	X	X										X								Impacted ?
GP6-S-30.0	9/30/02	16:11		soil	2	X	X										X								
GP6-W-74.0	10/1/02	14:00		water	5	X	X										X								
GP4-W-98.0	9/30/02	11:00		water	5	X	X										X								
GP6-W-98.0	10/1/02	17:30		water	5	X	X										X								
GP-DUP	10/1/02	7:30		water	5	X	X										X								
trip 2				water	2																				Hold

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
X II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. # ___
Bill To: ___

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature]	Signature: Frank Black	Signature:	Signature:
Date/Time: 10/2/02 9:00	Date/Time: 10/2/02 1700	Date/Time:	Date/Time:
Printed Name: Tony Silva	Printed Name: Black	Printed Name:	Printed Name:
Firm: MFA, Inc.	Firm: CAS	Firm:	Firm:

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client MEA Work Order K22 0 7046

Cooler received on 10/2/02 and opened on 10/2/02 by TBlack

1. Were custody seals on outside of cooler? **Y** N
   If yes, how many and where? 1 front 1 side
2. Were seals intact and signature & date correct? **Y** N
3. COC #
   Temperature of cooler(s) upon receipt: 4.3
   Temperature Blank: 2.8
4. Were custody papers properly filled out (ink, signed, etc.)? **Y** N
5. Type of packing material present bags - mesh - gel packs
6. Did all bottles arrive in good condition (unbroken)? **Y** N
7. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? **Y** N
8. Did all bottle labels and tags agree with custody papers? **Y** N
9. Were the correct types of bottles used for the tests indicated? **Y** N
10. Were all of the preserved bottles received at the lab with the appropriate pH? Y **N**
11. Were VOA vials checked for absence of air bubbles, and if present, noted below? **Y** N
12. Did the bottles originate from CAS/K or a branch laboratory? **Y** N
13. Are CWA Microbiology samples received with > ½ the 24 hr. hold time remaining from collection? ~~Y N~~
14. Was CL2/Residual negative? ~~Y N~~

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials
GP6-W-74.0	NAOH	2ml	EM41030109	2L		TB
GP4-W-98.0	↓	↓	↓	↓		↓
GP6-W.98.0	↓	↓	↓	↓		↓
GP-Dup	↓	↓	↓	↓		↓

General Chemistry Parameters

SCOEPA00011336

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	9/30,10/1/02
Sample Matrix:	Water	**Date Received:**	10/2/02

Cyanide, Total

Prep Method:	NONE	Units:	mg/L (ppm)
Analysis Method:	335.4	Basis:	NA
Test Notes:			

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
GP6-W-74.0	K2207046-004	0.01	1	NA	10/12/02	0.62	
GP4-W-98.0	K2207046-005	0.01	1	NA	10/12/02	0.91	
GP6-W-98.0	K2207046-006	0.01	1	NA	10/12/02	0.70	
GP-Dup	K2207046-007	0.01	1	NA	10/12/02	0.65	
Method Blank	K2207046-MB	0.01	1	NA	10/12/02	ND	

Approved By: HC Date: 11/4/02

1A/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 10/12/02

Duplicate Summary
Inorganic Parameters

Sample Name: Batch QC
Lab Code: K2207133-004DUP
Test Notes:

Units: mg/L (ppm)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Cyanide, Total	NONE	335.4	0.01	0.63	0.62	0.62	2	

Percent recoveries and relative percent differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

DUP/020597p

07046WET.BR1 - DUP 10/27/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/12/02

Matrix Spike Summary
Inorganic Parameters

Sample Name:	Batch QC	Units:	mg/L (ppm)
Lab Code:	K2207133-004MS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.4	0.01	0.10	0.63	0.71	84	75-125	

Percent recoveries and relative percent differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

MS/020597p

07046WET.BR1 - MS 10/27/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/12/02

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name:	Lab Control Sample	Units:	mg/L (ppm)
Lab Code:	K2207046-LCS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.4	0.86	0.95	111	85-115	

Percent recoveries and relative percent differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

LCS/020597p

Volatile Organic Compounds
Method 8260

SCOEPA00011341

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Collected: 10/01/2002
Date Received: 10/02/2002

Volatile Organic Compounds

Sample Name: GP6-W-74.0
Lab Code: K2207046-004

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Chloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Vinyl Chloride	**47**		0.50	1	10/10/02	10/10/02	KWG0208025	
Bromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Chloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Trichlorofluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Acetone	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethene	**2.1**		0.50	1	10/10/02	10/10/02	KWG0208025	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Carbon Disulfide	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Methylene Chloride	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
trans-1,2-Dichloroethene	**3.7**		0.50	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
2-Butanone (MEK)	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
2,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
cis-1,2-Dichloroethene	**230**	D	2.5	5	10/11/02	10/11/02	KWG0208091	
Chloroform	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Carbon Tetrachloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Benzene	**7.9**		0.50	1	10/10/02	10/10/02	KWG0208025	
Trichloroethene (TCE)	**360**	D	2.0	10	10/11/02	10/11/02	KWG0208091	
1,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromodichloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Dibromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
2-Hexanone	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Toluene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,2-Trichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
1,3-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	10/01/2002
Sample Matrix:	Water	Date Received:	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-W-74.0	Units:	ug/L
Lab Code:	K2207046-004	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Dibromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Chlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Ethylbenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
m,p-Xylenes	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
o-Xylene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Styrene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromoform	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Isopropylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
n-Propylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
2-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
4-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
tert-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
sec-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,3-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
4-Isopropyltoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,4-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
n-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Naphthalene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Hexachlorobutadiene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-W-74.0	**Units:**	ug/L
Lab Code:	K2207046-004	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	100	78-124	10/10/02	Acceptable
Toluene-d8	106	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	103	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP4-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Chloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Vinyl Chloride	**9.1**		0.50	1	10/11/02	10/11/02	KWG0208091	
Bromomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Chloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Trichlorofluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Acetone	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
1,1-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	*
Carbon Disulfide	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Methylene Chloride	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1-Dichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
2-Butanone (MEK)	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
2,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
cis-1,2-Dichloroethene	**21**		0.50	1	10/11/02	10/11/02	KWG0208091	
Chloroform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Carbon Tetrachloride	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Benzene	**87**	D	2.5	5	10/11/02	10/11/02	KWG0208091	
Trichloroethene (TCE)	**0.60**		0.20	1	10/11/02	10/11/02	KWG0208091	
1,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromodichloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Dibromomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
2-Hexanone	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Toluene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1,2-Trichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
1,3-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	

Comments:

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Collected: 09/30/2002
Date Received: 10/02/2002

Volatile Organic Compounds

Sample Name: GP4-W-98.0
Lab Code: K2207046-005

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Dibromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Chlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Ethylbenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
m,p-Xylenes	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
o-Xylene	**0.59**		0.50	1	10/11/02	10/11/02	KWG0208091	
Styrene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromoform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Isopropylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2,3-Trichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
n-Propylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
2-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
4-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
tert-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
sec-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,3-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
4-Isopropyltoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,4-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
n-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Naphthalene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Hexachlorobutadiene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

:lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
'rdject:	Wacker/8128.01.04/3	Date Collected:	09/30/2002
ample Matrix:	Water	Date Received:	10/02/2002

Volatile Organic Compounds

:ample Name:	GP4-W-98.0	Units:	ug/L
.ab Code:	K2207046-005	Basis:	NA

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
)ibromofluoromethane	100	78-124	10/11/02	Acceptable
'oluene-d8	106	87-118	10/11/02	Acceptable
-Bromofluorobenzene	104	81-113	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Chloromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Vinyl Chloride	**2700**	D	25	50	10/10/02	10/10/02	KWG0208025	
Bromomethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Chloroethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Trichlorofluoromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Acetone	ND	U	1000	50	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethene	**39**	D	25	50	10/10/02	10/10/02	KWG0208025	
Methyl tert-Butyl Ether	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Carbon Disulfide	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Methylene Chloride	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
trans-1,2-Dichloroethene	**39**	D	25	50	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
2-Butanone (MEK)	ND	U	1000	50	10/10/02	10/10/02	KWG0208025	
2,2-Dichloropropane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
cis-1,2-Dichloroethene	**16000**	D	250	500	10/11/02	10/11/02	KWG0208091	
Chloroform	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Bromochloromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,1,1-Trichloroethane (TCA)	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,1-Dichloropropene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Carbon Tetrachloride	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,2-Dichloroethane (EDC)	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Benzene	**220**	D	25	50	10/10/02	10/10/02	KWG0208025	
Trichloroethene (TCE)	**2500**	D	10	50	10/10/02	10/10/02	KWG0208025	
1,2-Dichloropropane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Bromodichloromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Dibromomethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
2-Hexanone	ND	U	1000	50	10/10/02	10/10/02	KWG0208025	
cis-1,3-Dichloropropene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Toluene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
trans-1,3-Dichloropropene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,1,2-Trichloroethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
4-Methyl-2-pentanone (MIBK)	ND	U	1000	50	10/10/02	10/10/02	KWG0208025	
1,3-Dichloropropane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	10/01/2002
Sample Matrix:	Water	Date Received:	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-W-98.0	Units:	ug/L
Lab Code:	K2207046-006	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Dibromochloromethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,2-Dibromoethane (EDB)	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
Chlorobenzene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,1,1,2-Tetrachloroethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Ethylbenzene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
m,p-Xylenes	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
o-Xylene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Styrene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Bromoform	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Isopropylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,1,2,2-Tetrachloroethane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichloropropane	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
Bromobenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
n-Propylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
2-Chlorotoluene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
4-Chlorotoluene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,3,5-Trimethylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
tert-Butylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,2,4-Trimethylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
sec-Butylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,3-Dichlorobenzene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
4-Isopropyltoluene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,4-Dichlorobenzene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
n-Butylbenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,2-Dichlorobenzene	ND	U	25	50	10/10/02	10/10/02	KWG0208025	
1,2-Dibromo-3-chloropropane	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,2,4-Trichlorobenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichlorobenzene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
Naphthalene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	
Hexachlorobutadiene	ND	U	100	50	10/10/02	10/10/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-006	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	78-124	10/10/02	Acceptable
Toluene-d8	104	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	102	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	10/01/2002
Sample Matrix:	Water	Date Received:	10/02/2002

Volatile Organic Compounds

Sample Name:	GP-Dup	Units:	ug/L
Lab Code:	K2207046-007	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Chloromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Vinyl Chloride	**2600**	D	25	50	10/11/02	10/11/02	KWG0208025	
Bromomethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Chloroethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Trichlorofluoromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Acetone	ND	U	1000	50	10/11/02	10/11/02	KWG0208025	
1,1-Dichloroethene	**36**	D	25	50	10/11/02	10/11/02	KWG0208025	
Methyl tert-Butyl Ether	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Carbon Disulfide	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Methylene Chloride	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
trans-1,2-Dichloroethene	**39**	D	25	50	10/11/02	10/11/02	KWG0208025	
1,1-Dichloroethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
2-Butanone (MEK)	ND	U	1000	50	10/11/02	10/11/02	KWG0208025	
2,2-Dichloropropane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
cis-1,2-Dichloroethene	**16000**	D	250	500	10/11/02	10/11/02	KWG0208091	
Chloroform	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Bromochloromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,1,1-Trichloroethane (TCA)	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,1-Dichloropropene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Carbon Tetrachloride	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,2-Dichloroethane (EDC)	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Benzene	**200**	D	25	50	10/11/02	10/11/02	KWG0208025	
Trichloroethene (TCE)	**2400**	D	10	50	10/11/02	10/11/02	KWG0208025	
1,2-Dichloropropane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Bromodichloromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Dibromomethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
2-Hexanone	ND	U	1000	50	10/11/02	10/11/02	KWG0208025	
cis-1,3-Dichloropropene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Toluene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
trans-1,3-Dichloropropene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,1,2-Trichloroethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
4-Methyl-2-pentanone (MIBK)	ND	U	1000	50	10/11/02	10/11/02	KWG0208025	
1,3-Dichloropropane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Collected: 10/01/2002
Date Received: 10/02/2002

Volatile Organic Compounds

Sample Name: GP-Dup
Lab Code: K2207046-007

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Dibromochloromethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,2-Dibromoethane (EDB)	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
Chlorobenzene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,1,1,2-Tetrachloroethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Ethylbenzene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
m,p-Xylenes	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
o-Xylene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Styrene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Bromoform	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Isopropylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,1,2,2-Tetrachloroethane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,2,3-Trichloropropane	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
Bromobenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
n-Propylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
2-Chlorotoluene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
4-Chlorotoluene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,3,5-Trimethylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
tert-Butylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,2,4-Trimethylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
sec-Butylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,3-Dichlorobenzene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
4-Isopropyltoluene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,4-Dichlorobenzene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
n-Butylbenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,2-Dichlorobenzene	ND	U	25	50	10/11/02	10/11/02	KWG0208025	
1,2-Dibromo-3-chloropropane	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,2,4-Trichlorobenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
1,2,3-Trichlorobenzene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
Naphthalene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	
Hexachlorobutadiene	ND	U	100	50	10/11/02	10/11/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	10/01/2002
Sample Matrix:	Water	Date Received:	10/02/2002

Volatile Organic Compounds

Sample Name:	GP-Dup	Units:	ug/L
Lab Code:	K2207046-007	Basis:	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	97	78-124	10/11/02	Acceptable
Toluene-d8	105	87-118	10/11/02	Acceptable
4-Bromofluorobenzene	101	81-113	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208025-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Chloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Vinyl Chloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Chloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Trichlorofluoromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Acetone	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Carbon Disulfide	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Methylene Chloride	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
2-Butanone (MEK)	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
2,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Chloroform	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Carbon Tetrachloride	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Benzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Trichloroethene (TCE)	ND	U	0.20	1	10/10/02	10/10/02	KWG0208025	
1,2-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromodichloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Dibromomethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
2-Hexanone	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Toluene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,2-Trichloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/10/02	10/10/02	KWG0208025	
1,3-Dichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/L
Lab Code:	KWG0208025-4	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Dibromochloromethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Chlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Ethylbenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
m,p-Xylenes	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
o-Xylene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Styrene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromoform	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Isopropylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichloropropane	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
Bromobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
n-Propylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
2-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
4-Chlorotoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
tert-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
sec-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,3-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
4-Isopropyltoluene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,4-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
n-Butylbenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2-Dichlorobenzene	ND	U	0.50	1	10/10/02	10/10/02	KWG0208025	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Naphthalene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	
Hexachlorobutadiene	ND	U	2.0	1	10/10/02	10/10/02	KWG0208025	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208025-4	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	78-124	10/10/02	Acceptable
Toluene-d8	108	87-118	10/10/02	Acceptable
4-Bromofluorobenzene	103	81-113	10/10/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/L
Lab Code:	KWG0208091-4	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Chloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Vinyl Chloride	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Chloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Trichlorofluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Acetone	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
,1-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	*
Carbon Disulfide	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Methylene Chloride	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
rans-1,2-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
,1-Dichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
-Butanone (MEK)	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
is-1,2-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Chloroform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
,1-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Carbon Tetrachloride	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
,2-Dichloroethane (EDC)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Benzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Trichloroethene (TCE)	ND	U	0.20	1	10/11/02	10/11/02	KWG0208091	
,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromodichloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Dibromomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
-Hexanone	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
is-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Toluene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
rans-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
,1,2-Trichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/11/02	10/11/02	KWG0208091	
,3-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0208091-4

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Dibromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Chlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Ethylbenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
m,p-Xylenes	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
o-Xylene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Styrene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromoform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Isopropylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2,3-Trichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
Bromobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
n-Propylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
2-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
4-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
tert-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
sec-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,3-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
4-Isopropyltoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,4-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
n-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208091	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Naphthalene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	
Hexachlorobutadiene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208091	

* See Case Narrative

Comments:

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lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/L
ab Code:	KWG0208091-4	Basis:	NA

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	100	78-124	10/11/02	Acceptable
oluene-d8	105	87-118	10/11/02	Acceptable
-Bromofluorobenzene	103	81-113	10/11/02	Acceptable

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046
Date Collected: 09/30/2002
Date Received: 10/02/2002

Volatile Organic Compounds

Sample Name: GP6-S-15.0
Lab Code: K2207046-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Acetone	ND	U	53	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	11	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	2.1	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-S-15.0	**Units:**	ug/Kg
Lab Code:	K2207046-001	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Dibromochloromethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromoethane (EDB)	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Chlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,1,1,2-Tetrachloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Ethylbenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
m,p-Xylenes	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
o-Xylene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Styrene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromoform	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Isopropylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,1,2,2-Tetrachloroethane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichloropropane	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
Bromobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
n-Propylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
2-Chlorotoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
4-Chlorotoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,3,5-Trimethylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
tert-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trimethylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
sec-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
4-Isopropyltoluene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,4-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
n-Butylbenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	*
1,2-Dichlorobenzene	ND	U	5.3	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromo-3-chloropropane	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trichlorobenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichlorobenzene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Naphthalene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	
Hexachlorobutadiene	ND	U	21	1	10/03/02	10/03/02	KWG0207756	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-S-15.0	**Units:**	ug/Kg
Lab Code:	K2207046-001	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	97	84-121	10/03/02	Acceptable
Toluene-d8	103	80-125	10/03/02	Acceptable
4-Bromofluorobenzene	99	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
roject:	Wacker/8128.01.04/3	Date Collected:	09/30/2002
ample Matrix:	Soil	Date Received:	10/02/2002

Volatile Organic Compounds

ample Name:	GP6-S-23.0	Units:	mg/Kg
ab Code:	K2207046-002	Basis:	Dry
xtraction Method:	EPA 5035/5030B	Level:	Med
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ichlorodifluoromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
hloromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
inyl Chloride	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
romomethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
hloroethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
richlorofluoromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
cetone	ND	U	2.9	1	10/04/02	10/05/02	KWG0207885	
,1-Dichloroethene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
lethyl tert-Butyl Ether	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
arbon Disulfide	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
lethylene Chloride	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
ans-1,2-Dichloroethene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
,1-Dichloroethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
-Butanone (MEK)	ND	U	2.9	1	10/04/02	10/05/02	KWG0207885	
,2-Dichloropropane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
is-1,2-Dichloroethene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
hloroform	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
romochloromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
,1,1-Trichloroethane (TCA)	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
,1-Dichloropropene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
arbon Tetrachloride	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
,2-Dichloroethane (EDC)	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
enzene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
richloroethene (TCE)	ND	U	0.029	1	10/04/02	10/05/02	KWG0207885	
,2-Dichloropropane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
romodichloromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	*
ibromomethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	*
-Hexanone	ND	U	2.9	1	10/04/02	10/05/02	KWG0207885	
is-1,3-Dichloropropene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
oluene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
rans-1,3-Dichloropropene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	*
,1,2-Trichloroethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
-Methyl-2-pentanone (MIBK)	ND	U	2.9	1	10/04/02	10/05/02	KWG0207885	
,3-Dichloropropane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	09/30/2002
Sample Matrix:	Soil	Date Received:	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-S-23.0	Units:	mg/Kg
Lab Code:	K2207046-002	Basis:	Dry
Extraction Method:	EPA 5035/5030B	Level:	Med
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Dibromochloromethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromoethane (EDB)	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
Chlorobenzene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
1,1,1,2-Tetrachloroethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Ethylbenzene	**0.15**		0.071	1	10/04/02	10/05/02	KWG0207885	
m,p-Xylenes	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
o-Xylene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Styrene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Bromoform	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Isopropylbenzene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
1,1,2,2-Tetrachloroethane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichloropropane	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
Bromobenzene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
n-Propylbenzene	**0.30**		0.29	1	10/04/02	10/05/02	KWG0207885	
2-Chlorotoluene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
4-Chlorotoluene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
1,3,5-Trimethylbenzene	**0.61**		0.29	1	10/04/02	10/05/02	KWG0207885	
tert-Butylbenzene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trimethylbenzene	**2.4**		0.29	1	10/04/02	10/05/02	KWG0207885	
sec-Butylbenzene	**0.40**		0.29	1	10/04/02	10/05/02	KWG0207885	
1,3-Dichlorobenzene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
4-Isopropyltoluene	**0.95**		0.29	1	10/04/02	10/05/02	KWG0207885	
1,4-Dichlorobenzene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
n-Butylbenzene	ND	Ui	0.87	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichlorobenzene	ND	U	0.071	1	10/04/02	10/05/02	KWG0207885	
1,2-Dibromo-3-chloropropane	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
1,2,4-Trichlorobenzene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
1,2,3-Trichlorobenzene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	
Naphthalene	**3.4**		0.29	1	10/04/02	10/05/02	KWG0207885	
Hexachlorobutadiene	ND	U	0.29	1	10/04/02	10/05/02	KWG0207885	

See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-S-23.0	**Units:**	mg/Kg
Lab Code:	K2207046-002	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	71	41-152	10/05/02	Acceptable
Toluene-d8	80	32-166	10/05/02	Acceptable
4-Bromofluorobenzene	82	40-153	10/05/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046
Date Collected: 09/30/2002
Date Received: 10/02/2002

Volatile Organic Compounds

Sample Name: GP6-S-30.0
Lab Code: K2207046-003

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Acetone	**98**		74	1	10/03/02	10/03/02	KWG0207756	*
1,1-Dichloroethene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	15	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	3.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichloropropane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	

Comments:

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
rojject:	Wacker/8128.01.04/3	Date Collected:	09/30/2002
ample Matrix:	Soil	Date Received:	10/02/2002

Volatile Organic Compounds

ample Name:	GP6-S-30.0	Units:	ug/Kg
ab Code:	K2207046-003	Basis:	Dry
xtraction Method:	EPA 5030A	Level:	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
etrachloroethene (PCE)	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
ibromochloromethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
2-Dibromoethane (EDB)	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
hlorobenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Tetrachloroethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
thylbenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
,p-Xylenes	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Xylene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
yrene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
romoform	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
opropylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
1,2,2-Tetrachloroethane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
2,3-Trichloropropane	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
romobenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Propylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
Chlorotoluene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
Chlorotoluene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
3,5-Trimethylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
rt-Butylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
2,4-Trimethylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
c-Butylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
3-Dichlorobenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Isopropyltoluene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
4-Dichlorobenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
Butylbenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	*
2-Dichlorobenzene	ND	U	7.4	1	10/03/02	10/03/02	KWG0207756	
2-Dibromo-3-chloropropane	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
2,4-Trichlorobenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
2,3-Trichlorobenzene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
aphthalene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	
exachlorobutadiene	ND	U	30	1	10/03/02	10/03/02	KWG0207756	

See Case Narrative

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Volatile Organic Compounds

Sample Name:	GP6-S-30.0	**Units:**	ug/Kg
Lab Code:	K2207046-003	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	104	84-121	10/03/02	Acceptable
Toluene-d8	105	80-125	10/03/02	Acceptable
4-Bromofluorobenzene	99	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG0207756-4	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Vinyl Chloride	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromomethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Trichlorofluoromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Acetone	ND	U	50	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Methyl tert-Butyl Ether	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Carbon Disulfide	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	*
Methylene Chloride	ND	U	10	1	10/03/02	10/03/02	KWG0207756	
trans-1,2-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
2-Butanone (MEK)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
2,2-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
cis-1,2-Dichloroethene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Chloroform	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromochloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Carbon Tetrachloride	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloroethane (EDC)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Benzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Trichloroethene (TCE)	ND	U	2.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromodichloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Dibromomethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
2-Hexanone	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
cis-1,3-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Toluene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	*
trans-1,3-Dichloropropene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,2-Trichloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0207756-4

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Dibromochloromethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromoethane (EDB)	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Chlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Ethylbenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
m,p-Xylenes	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
o-Xylene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Styrene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromoform	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Isopropylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichloropropane	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
Bromobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
n-Propylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
2-Chlorotoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
4-Chlorotoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,3,5-Trimethylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
tert-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trimethylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
sec-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,3-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
4-Isopropyltoluene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,4-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
n-Butylbenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	*
1,2-Dichlorobenzene	ND	U	5.0	1	10/03/02	10/03/02	KWG0207756	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,4-Trichlorobenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
1,2,3-Trichlorobenzene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Naphthalene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	
Hexachlorobutadiene	ND	U	20	1	10/03/02	10/03/02	KWG0207756	

* See Case Narrative

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/Kg
ab Code:	KWG0207756-4	Basis:	Dry

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	100	84-121	10/03/02	Acceptable
oluene-d8	103	80-125	10/03/02	Acceptable
-Bromofluorobenzene	95	80-123	10/03/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	mg/Kg
Lab Code:	KWG0207885-8	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Vinyl Chloride	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromomethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Trichlorofluoromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Acetone	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Methyl tert-Butyl Ether	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Carbon Disulfide	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Methylene Chloride	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
trans-1,2-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
2-Butanone (MEK)	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
2,2-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
cis-1,2-Dichloroethene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Chloroform	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromochloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1,1-Trichloroethane (TCA)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Carbon Tetrachloride	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichloroethane (EDC)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Benzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Trichloroethene (TCE)	ND	U	0.020	1	10/04/02	10/05/02	KWG0207885	
1,2-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Bromodichloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
Dibromomethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
2-Hexanone	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
cis-1,3-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Toluene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
trans-1,3-Dichloropropene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	*
1,1,2-Trichloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
4-Methyl-2-pentanone (MIBK)	ND	U	2.0	1	10/04/02	10/05/02	KWG0207885	
1,3-Dichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	

Comments:

00046

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
roject:	Wacker/8128.01.04/3	**Date Collected:**	NA
ample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

ample Name:	Method Blank	**Units:**	mg/Kg
ab Code:	KWG0207885-8	**Basis:**	Dry
xtraction Method:	EPA 5035/5030B	**Level:**	Med
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
etrachloroethene (PCE)	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
ibromochloromethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
2-Dibromoethane (EDB)	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
hlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
1,1,2-Tetrachloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
hylbenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
,p-Xylenes	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Xylene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
yrene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
romoform	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
opropylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
1,2,2-Tetrachloroethane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
2,3-Trichloropropane	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
romobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Propylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Chlorotoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
Chlorotoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
3,5-Trimethylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
rt-Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
2,4-Trimethylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
c-Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
3-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Isopropyltoluene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
4-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
Butylbenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
2-Dichlorobenzene	ND	U	0.050	1	10/04/02	10/05/02	KWG0207885	
2-Dibromo-3-chloropropane	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
2,4-Trichlorobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
2,3-Trichlorobenzene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
aphthalene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	
exachlorobutadiene	ND	U	0.20	1	10/04/02	10/05/02	KWG0207885	

See Case Narrative

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	mg/Kg
Lab Code:	KWG0207885-8	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	79	41-152	10/05/02	Acceptable
Toluene-d8	85	32-166	10/05/02	Acceptable
4-Bromofluorobenzene	81	40-153	10/05/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

'lient: Maul Foster & Alongi, Inc.
roject: Wacker/8128.01.04/3
ample Matrix: Water

Service Request: K2207046

Surrogate Recovery Summary
Volatile Organic Compounds

:xtraction Method: EPA 5030B
.nalysis Method: 8260B

Units: PERCENT
Level: Low

ample Name	Lab Code	Sur1	Sur2	Sur3
;P6-W-74.0	K2207046-004	100	106	103
;P4-W-98.0	K2207046-005	100	106	104
;P6-W-98.0	K2207046-006	99	104	102
;P-Dup	K2207046-007	97	105	101
'ethod Blank	KWG0208025-4	101	108	103
'ethod Blank	KWG0208091-4	100	105	103
;P6-W-98.0MS	KWG0208091-1	99	107	101
;P6-W-98.0DMS	KWG0208091-2	99	105	104
.ab Control Sample	KWG0208025-3	99	106	106
.ab Control Sample	KWG0208091-3	97	106	105

;urrogate Recovery Control Limits (%)

;ur1 =	Dibromofluoromethane	78-124
;ur2 =	Toluene-d8	87-118
;ur3 =	4-Bromofluorobenzene	81-113

'esults flagged with an asterisk (*) indicate values outside control criteria.
'esults flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP6-S-15.0	K2207046-001	97	103	99
GP6-S-30.0	K2207046-003	104	105	99
Method Blank	KWG0207756-4	100	103	95
Lab Control Sample	KWG0207756-3	104	106	98

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	84-121
Sur2 =	Toluene-d8	80-125
Sur3 =	4-Bromofluorobenzene	80-123

Results flagged with an asterisk (*) indicate values outside control criteria.
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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5035/5030B
Analysis Method: 8260B

Units: PERCENT
Level: Med

Sample Name	Lab Code	Sur1		Sur2		Sur3	
GP6-S-23.0	K2207046-002	71		80		82	
Method Blank	KWG0207885-8	79		85		81	
Batch QC	K2206967-001	0	#	0	#	0	#
Batch QCMS	KWG0207885-5	0	#	0	#	0	#
Batch QCDMS	KWG0207885-6	0	#	0	#	0	#
Lab Control Sample	KWG0207885-7	76		80		78	

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	41-152
Sur2 =	Toluene-d8	32-166
Sur3 =	4-Bromofluorobenzene	40-153

Results flagged with an asterisk (*) indicate values outside control criteria.
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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/11/2002
Sample Matrix:	Water	**Date Analyzed:**	10/11/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	GP6-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG0208091

		GP6-W-98.0MS KWG0208091-1 Matrix Spike			GP6-W-98.0DMS KWG0208091-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,1-Dichloroethene	39	4760	5000	94	4500	5000	89	67-157	6	30
Benzene	220	5220	5000	100	4980	5000	95	76-138	5	30
Trichloroethene (TCE)	2500	7640	5000	102	7270	5000	95	66-149	5	30
Toluene	ND	5030	5000	101	4840	5000	97	82-131	4	30
Chlorobenzene	ND	5140	5000	103	4950	5000	99	70-131	4	30
1,2-Dichlorobenzene	ND	5030	5000	101	4870	5000	97	70-126	3	30
Naphthalene	ND	4850	5000	97	4820	5000	96	50-149	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00052

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
roject:	Wacker/8128.01.04/3	Date Extracted:	10/04/2002
ample Matrix:	Soil	Date Analyzed:	10/05/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

ample Name:	Batch QC	Units:	mg/Kg
ab Code:	K2206967-001	Basis:	Dry
xtraction Method:	EPA 5035/5030B	Level:	Med
nalysis Method:	8260B	Extraction Lot:	KWG0207885

		Batch QCMS KWG0207885-5 Matrix Spike			Batch QCDMS KWG0207885-6 Duplicate Matrix Spike					
nalyte Name	Sample Result	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
,1-Dichloroethene	ND	281	292	96	278	292	95	51-127	1	40
enzene	ND	283	292	97	282	292	96	57-121	1	40
richloroethene (TCE)	ND	317	292	108	317	292	108	45-127	0	40
oluene	ND	283	292	97	276	292	94	34-134	3	40
hlorobenzene	ND	307	292	105	312	292	107	37-126	1	40
,2-Dichlorobenzene	ND	283	292	97	291	292	99	34-131	3	40
aphthalene	1200	1640E	292	137 #	1850E	292	208 #	20-139	12	40

esults flagged with an asterisk (*) indicate values outside control criteria.

esults flagged with a pound (#) indicate the control criteria is not applicable.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046
Date Extracted: 10/10/2002
Date Analyzed: 10/10/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0208025

	Lab Control Sample KWG0208025-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Dichlorodifluoromethane	10.5	10.0	105	33-189
Chloromethane	7.91	10.0	79	66-128
Vinyl Chloride	10.5	10.0	105	76-135
Bromomethane	7.24	10.0	72	30-188
Chloroethane	9.68	10.0	97	79-131
Trichlorofluoromethane	10.4	10.0	104	73-127
Acetone	48.7	50.0	97	60-157
1,1-Dichloroethene	10.1	10.0	101	79-137
Methyl tert-Butyl Ether	7.92	10.0	79	78-128
Carbon Disulfide	19.9	20.0	99	68-118
Methylene Chloride	9.90	10.0	99	68-135
trans-1,2-Dichloroethene	9.77	10.0	98	88-127
1,1-Dichloroethane	11.1	10.0	111	89-133
2-Butanone (MEK)	49.5	50.0	99	78-144
2,2-Dichloropropane	11.9	10.0	119	71-138
cis-1,2-Dichloroethene	9.46	10.0	95	90-126
Chloroform	10.5	10.0	105	88-117
Bromochloromethane	11.2	10.0	112	80-133
1,1,1-Trichloroethane (TCA)	11.0	10.0	110	83-122
1,1-Dichloropropene	11.0	10.0	110	87-137
Carbon Tetrachloride	11.6	10.0	116	87-131
1,2-Dichloroethane (EDC)	10.3	10.0	103	73-130
Benzene	10.4	10.0	104	90-120
Trichloroethene (TCE)	10.8	10.0	108	83-131
1,2-Dichloropropane	10.1	10.0	101	87-121
Bromodichloromethane	9.74	10.0	97	84-114
Dibromomethane	10.5	10.0	105	76-130
2-Hexanone	48.5	50.0	97	68-135
cis-1,3-Dichloropropene	11.0	10.0	110	90-126
Toluene	10.5	10.0	105	89-119
trans-1,3-Dichloropropene	10.4	10.0	104	77-113
1,1,2-Trichloroethane	10.5	10.0	105	81-116
4-Methyl-2-pentanone (MIBK)	48.7	50.0	97	79-138
1,3-Dichloropropane	10.4	10.0	104	76-129
Tetrachloroethene (PCE)	11.9	10.0	119	82-123
Dibromochloromethane	10.4	10.0	104	83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Extracted:	10/10/2002
Sample Matrix:	Water	Date Analyzed:	10/10/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	Units:	ug/L
Analysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208025

Analyte Name	Lab Control Sample KWG0208025-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
,2-Dibromoethane (EDB)	10.8	10.0	108	74-130
Chlorobenzene	10.7	10.0	107	86-115
,1,1,2-Tetrachloroethane	10.8	10.0	108	88-118
Ethylbenzene	11.3	10.0	113	89-124
n,p-Xylenes	21.9	20.0	109	90-122
o-Xylene	11.1	10.0	111	88-126
Styrene	11.2	10.0	112	91-123
Bromoform	11.0	10.0	110	76-125
sopropylbenzene	10.6	10.0	106	82-123
,1,2,2-Tetrachloroethane	10.1	10.0	101	78-117
,2,3-Trichloropropane	11.0	10.0	110	75-127
Bromobenzene	10.5	10.0	105	76-129
n-Propylbenzene	10.9	10.0	109	83-128
2-Chlorotoluene	10.4	10.0	104	74-131
4-Chlorotoluene	10.4	10.0	104	87-119
,3,5-Trimethylbenzene	10.8	10.0	108	85-128
ert-Butylbenzene	10.5	10.0	105	83-129
,2,4-Trimethylbenzene	11.0	10.0	110	88-129
ec-Butylbenzene	11.1	10.0	111	84-133
,3-Dichlorobenzene	10.4	10.0	104	87-116
4-Isopropyltoluene	10.6	10.0	106	81-126
,4-Dichlorobenzene	10.4	10.0	104	86-115
n-Butylbenzene	10.9	10.0	109	79-134
,2-Dichlorobenzene	10.4	10.0	104	85-113
,2-Dibromo-3-chloropropane	11.2	10.0	112	55-136
,2,4-Trichlorobenzene	10.8	10.0	108	76-130
,2,3-Trichlorobenzene	10.5	10.0	105	70-134
Naphthalene	10.2	10.0	102	71-137
Hexachlorobutadiene	12.0	10.0	120	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00055

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/11/2002
Sample Matrix:	Water	**Date Analyzed:**	10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	**Units:**	ug/L
Analysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0208091

	Lab Control Sample KWG0208091-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Dichlorodifluoromethane	10.4	10.0	104	33-189
Chloromethane	7.89	10.0	79	66-128
Vinyl Chloride	10.7	10.0	107	76-135
Bromomethane	7.15	10.0	72	30-188
Chloroethane	9.68	10.0	97	79-131
Trichlorofluoromethane	10.5	10.0	105	73-127
Acetone	53.5	50.0	107	60-157
1,1-Dichloroethene	10.2	10.0	102	79-137
Methyl tert-Butyl Ether	7.39	10.0	74 *	78-128
Carbon Disulfide	20.3	20.0	102	68-118
Methylene Chloride	10.3	10.0	103	68-135
trans-1,2-Dichloroethene	9.93	10.0	99	88-127
1,1-Dichloroethane	11.2	10.0	112	89-133
2-Butanone (MEK)	47.3	50.0	95	78-144
2,2-Dichloropropane	10.1	10.0	101	71-138
cis-1,2-Dichloroethene	9.68	10.0	97	90-126
Chloroform	10.7	10.0	107	88-117
Bromochloromethane	11.5	10.0	115	80-133
1,1,1-Trichloroethane (TCA)	11.4	10.0	114	83-122
1,1-Dichloropropene	11.2	10.0	112	87-137
Carbon Tetrachloride	12.0	10.0	120	87-131
1,2-Dichloroethane (EDC)	10.5	10.0	105	73-130
Benzene	10.7	10.0	107	90-120
Trichloroethene (TCE)	11.6	10.0	116	83-131
1,2-Dichloropropane	10.4	10.0	104	87-121
Bromodichloromethane	10.0	10.0	100	84-114
Dibromomethane	10.4	10.0	104	76-130
2-Hexanone	47.7	50.0	95	68-135
cis-1,3-Dichloropropene	10.9	10.0	109	90-126
Toluene	11.0	10.0	110	89-119
trans-1,3-Dichloropropene	10.2	10.0	102	77-113
1,1,2-Trichloroethane	10.3	10.0	103	81-116
4-Methyl-2-pentanone (MIBK)	46.7	50.0	93	79-138
1,3-Dichloropropane	10.5	10.0	105	76-129
Tetrachloroethene (PCE)	11.7	10.0	117	82-123
Dibromochloromethane	10.4	10.0	104	83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00056

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Extracted:	10/11/2002
Sample Matrix:	Water	Date Analyzed:	10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	Units:	ug/L
Analysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208091

Analyte Name	Lab Control Sample KWG0208091-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	10.7	10.0	107	74-130
Chlorobenzene	10.9	10.0	109	86-115
1,1,1,2-Tetrachloroethane	11.2	10.0	112	88-118
Ethylbenzene	11.5	10.0	115	89-124
m,p-Xylenes	22.8	20.0	114	90-122
o-Xylene	11.5	10.0	115	88-126
Styrene	11.5	10.0	115	91-123
Bromoform	10.9	10.0	109	76-125
Isopropylbenzene	10.8	10.0	108	82-123
1,1,2,2-Tetrachloroethane	9.52	10.0	95	78-117
1,2,3-Trichloropropane	11.2	10.0	112	75-127
Bromobenzene	11.0	10.0	110	76-129
n-Propylbenzene	11.3	10.0	113	83-128
2-Chlorotoluene	10.9	10.0	109	74-131
4-Chlorotoluene	10.8	10.0	108	87-119
1,3,5-Trimethylbenzene	11.1	10.0	111	85-128
tert-Butylbenzene	11.3	10.0	113	83-129
1,2,4-Trimethylbenzene	11.4	10.0	114	88-129
sec-Butylbenzene	11.6	10.0	116	84-133
1,3-Dichlorobenzene	10.7	10.0	107	87-116
4-Isopropyltoluene	10.8	10.0	108	81-126
1,4-Dichlorobenzene	10.7	10.0	107	86-115
n-Butylbenzene	11.2	10.0	112	79-134
1,2-Dichlorobenzene	10.5	10.0	105	85-113
1,2-Dibromo-3-chloropropane	11.0	10.0	110	55-136
1,2,4-Trichlorobenzene	10.5	10.0	105	76-130
1,2,3-Trichlorobenzene	10.3	10.0	103	70-134
Naphthalene	9.93	10.0	99	71-137
Hexachlorobutadiene	12.1	10.0	121	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00057

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046
Date Extracted: 10/03/2002
Date Analyzed: 10/03/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0207756

Analyte Name	Lab Control Sample KWG0207756-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dichlorodifluoromethane	51.1	50.0	102	46-130
Chloromethane	48.8	50.0	98	55-118
Vinyl Chloride	58.5	50.0	117	64-137
Bromomethane	64.8	50.0	130	58-147
Chloroethane	54.9	50.0	110	60-137
Trichlorofluoromethane	54.6	50.0	109	58-125
Acetone	195	250	78	59-111
1,1-Dichloroethene	55.7	50.0	111	76-135
Methyl tert-Butyl Ether	48.3	50.0	97	71-143
Carbon Disulfide	110	100	110 *	70-101
Methylene Chloride	55.2	50.0	110	76-117
rans-1,2-Dichloroethene	56.4	50.0	113	77-132
1,1-Dichloroethane	60.7	50.0	121	84-122
2-Butanone (MEK)	201	250	80	76-133
2,2-Dichloropropane	54.6	50.0	109	74-134
is-1,2-Dichloroethene	55.3	50.0	111	79-123
Chloroform	57.4	50.0	115	74-122
Bromochloromethane	57.5	50.0	115	77-131
,1,1-Trichloroethane (TCA)	54.0	50.0	108	66-137
,1-Dichloropropene	55.6	50.0	111	81-130
Carbon Tetrachloride	55.0	50.0	110	70-142
,2-Dichloroethane (EDC)	51.1	50.0	102	67-132
Benzene	55.9	50.0	112	84-115
Trichloroethene (TCE)	56.1	50.0	112	78-128
,2-Dichloropropane	50.0	50.0	100	84-114
Bromodichloromethane	49.7	50.0	99	72-120
Dibromomethane	51.2	50.0	102	75-124
-Hexanone	207	250	83	75-125
is-1,3-Dichloropropene	52.9	50.0	106	88-122
Toluene	60.0	50.0	120 *	80-119
rans-1,3-Dichloropropene	44.6	50.0	89	73-116
,1,2-Trichloroethane	46.6	50.0	93	76-115
-Methyl-2-pentanone (MIBK)	231	250	92	78-122
,3-Dichloropropane	45.5	50.0	91	74-111
Tetrachloroethene (PCE)	56.1	50.0	112	71-129
Dibromochloromethane	44.3	50.0	89	79-121

esults flagged with an asterisk (*) indicate values outside control criteria.
ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Extracted:	10/03/2002
Sample Matrix:	Soil	Date Analyzed:	10/03/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030A	Units:	ug/Kg
Analysis Method:	8260B	Basis:	Dry
		Level:	Low
		Extraction Lot:	KWG0207756

Analyte Name	Lab Control Sample KWG0207756-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
,2-Dibromoethane (EDB)	47.4	50.0	95	80-121
Chlorobenzene	54.2	50.0	108	77-117
,1,1,2-Tetrachloroethane	50.0	50.0	100	77-126
Ethylbenzene	55.2	50.0	110	78-125
n,p-Xylenes	109	100	109	74-122
o-Xylene	58.2	50.0	116	76-123
Styrene	58.1	50.0	116	78-127
Bromoform	47.6	50.0	95	75-139
sopropylbenzene	54.2	50.0	108	71-123
,1,2,2-Tetrachloroethane	43.9	50.0	88	72-120
,2,3-Trichloropropane	52.7	50.0	105	73-133
Bromobenzene	57.2	50.0	114	69-132
n-Propylbenzene	61.4	50.0	123	70-123
2-Chlorotoluene	57.6	50.0	115	69-123
4-Chlorotoluene	59.4	50.0	119	70-123
,3,5-Trimethylbenzene	57.3	50.0	115	70-127
ert-Butylbenzene	51.9	50.0	104	69-127
,2,4-Trimethylbenzene	56.6	50.0	113	73-138
ec-Butylbenzene	62.1	50.0	124	70-129
,3-Dichlorobenzene	58.2	50.0	116	72-122
4-Isopropyltoluene	57.3	50.0	115	71-119
,4-Dichlorobenzene	59.4	50.0	119	74-119
n-Butylbenzene	61.6	50.0	123 *	69-120
,2-Dichlorobenzene	56.2	50.0	112	72-121
,2-Dibromo-3-chloropropane	52.5	50.0	105	71-125
,2,4-Trichlorobenzene	63.9	50.0	128	68-130
,2,3-Trichlorobenzene	59.9	50.0	120	70-127
Naphthalene	52.6	50.0	105	74-127
Hexachlorobutadiene	64.5	50.0	129	60-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00059

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/04/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/05/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5035/5030B	**Units:**	mg/Kg
Analysis Method:	8260B	**Basis:**	Dry
		Level:	Med
		Extraction Lot:	KWG0207885

	Lab Control Sample KWG0207885-7 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Dichlorodifluoromethane	0.992	1.00	99	10-145
Chloromethane	0.824	1.00	82	51-120
Vinyl Chloride	0.916	1.00	92	51-154
Bromomethane	0.260	1.00	26	10-115
Chloroethane	0.782	1.00	78	29-141
Trichlorofluoromethane	0.756	1.00	76	53-141
Acetone	3.52	5.00	70	61-152
,1-Dichloroethene	0.793	1.00	79	68-145
Methyl tert-Butyl Ether	0.686	1.00	69	50-150
Carbon Disulfide	1.57	2.00	79	58-133
Methylene Chloride	0.777	1.00	78	77-127
rans-1,2-Dichloroethene	0.790	1.00	79	76-138
,1-Dichloroethane	0.823	1.00	82	82-134
-Butanone (MEK)	4.20	5.00	84	60-148
,2-Dichloropropane	0.655	1.00	66	50-152
is-1,2-Dichloroethene	0.818	1.00	82	49-158
Chloroform	0.797	1.00	80	77-135
Bromochloromethane	0.876	1.00	88	76-134
,1,1-Trichloroethane (TCA)	0.750	1.00	75	68-139
,1-Dichloropropene	0.795	1.00	80	68-140
Carbon Tetrachloride	0.777	1.00	78	63-147
,2-Dichloroethane (EDC)	0.769	1.00	77	70-141
Benzene	0.818	1.00	82	66-136
Trichloroethene (TCE)	0.898	1.00	90	77-146
,2-Dichloropropane	0.791	1.00	79	78-136
Bromodichloromethane	0.700	1.00	70 *	76-128
Dibromomethane	0.761	1.00	76 *	77-128
-Hexanone	4.22	5.00	84	52-152
is-1,3-Dichloropropene	0.749	1.00	75	74-135
oluene	0.824	1.00	82	77-130
ans-1,3-Dichloropropene	0.692	1.00	69 *	71-134
,1,2-Trichloroethane	0.844	1.00	84	76-134
-Methyl-2-pentanone (MIBK)	4.30	5.00	86	57-138
,3-Dichloropropane	0.845	1.00	85	77-127
etrachloroethene (PCE)	0.926	1.00	93	71-136
Dibromochloromethane	0.828	1.00	83	67-137

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00060

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207046
Project:	Wacker/8128.01.04/3	Date Extracted:	10/04/2002
Sample Matrix:	Soil	Date Analyzed:	10/05/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5035/5030B	Units:	mg/Kg
Analysis Method:	8260B	Basis:	Dry
		Level:	Med
		Extraction Lot:	KWG0207885

	Lab Control Sample KWG0207885-7 Lab Control Spike			
Analyte Name	Result	Expected	%Rec	%Rec Limits
,2-Dibromoethane (EDB)	0.842	1.00	84	73-135
Chlorobenzene	0.911	1.00	91	78-132
,1,1,2-Tetrachloroethane	0.914	1.00	91	69-143
Ethylbenzene	0.909	1.00	91	74-136
n,p-Xylenes	1.81	2.00	90	78-136
o-Xylene	0.906	1.00	91	78-134
Styrene	0.905	1.00	91	76-138
Bromoform	0.872	1.00	87	60-140
sopropylbenzene	0.843	1.00	84	73-134
,1,2,2-Tetrachloroethane	0.718	1.00	72	59-142
,2,3-Trichloropropane	0.827	1.00	83	69-141
Bromobenzene	0.895	1.00	90	73-137
n-Propylbenzene	0.813	1.00	81	77-133
-Chlorotoluene	0.808	1.00	81	71-138
-Chlorotoluene	0.795	1.00	80	76-135
,3,5-Trimethylbenzene	0.832	1.00	83	74-142
ert-Butylbenzene	0.861	1.00	86	70-142
,2,4-Trimethylbenzene	0.837	1.00	84	76-146
ec-Butylbenzene	0.838	1.00	84	72-142
,3-Dichlorobenzene	0.825	1.00	83	73-143
-Isopropyltoluene	0.804	1.00	80	70-137
,4-Dichlorobenzene	0.839	1.00	84	74-136
n-Butylbenzene	0.718	1.00	72	72-140
,2-Dichlorobenzene	0.842	1.00	84	75-135
,2-Dibromo-3-chloropropane	0.762	1.00	76	59-143
,2,4-Trichlorobenzene	0.818	1.00	82	67-144
,2,3-Trichlorobenzene	0.913	1.00	91	63-155
Naphthalene	0.807	1.00	81	61-155
Hexachlorobutadiene	0.898	1.00	90	58-152

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00061

Polynuclear Aromatic Hydrocarbons

00062

SCOEPA00011388

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-W-74.0	**Units:**	ug/L
Lab Code:	K2207046-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.20**		0.020	1	10/03/02	10/16/02	KWG0207716	
2-Methylnaphthalene	**0.023**		0.020	1	10/03/02	10/16/02	KWG0207716	
Acenaphthylene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Acenaphthene	**0.049**		0.020	1	10/03/02	10/16/02	KWG0207716	
Dibenzofuran	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Fluorene	**0.028**		0.020	1	10/03/02	10/16/02	KWG0207716	
Phenanthrene	**0.20**		0.020	1	10/03/02	10/16/02	KWG0207716	
Anthracene	**0.064**		0.020	1	10/03/02	10/16/02	KWG0207716	
Fluoranthene	**0.19**		0.020	1	10/03/02	10/16/02	KWG0207716	
Pyrene	**0.24**		0.020	1	10/03/02	10/16/02	KWG0207716	
Benz(a)anthracene	**0.070**		0.020	1	10/03/02	10/16/02	KWG0207716	
Chrysene	**0.080**		0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(b)fluoranthene	**0.047**		0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(k)fluoranthene	**0.051**		0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(a)pyrene	**0.073**		0.020	1	10/03/02	10/16/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	**0.044**		0.020	1	10/03/02	10/16/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(g,h,i)perylene	**0.050**		0.020	1	10/03/02	10/16/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	57	43-96	10/16/02	Acceptable
Fluoranthene-d10	64	20-131	10/16/02	Acceptable
Terphenyl-d14	55	13-146	10/16/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP4-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.40**		0.020	1	10/03/02	10/16/02	KWG0207716	
2-Methylnaphthalene	**0.040**		0.020	1	10/03/02	10/16/02	KWG0207716	
Acenaphthylene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Acenaphthene	**0.036**		0.020	1	10/03/02	10/16/02	KWG0207716	
Dibenzofuran	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Fluorene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Phenanthrene	**0.027**		0.020	1	10/03/02	10/16/02	KWG0207716	
Anthracene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Fluoranthene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Pyrene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benz(a)anthracene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Chrysene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(b)fluoranthene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(k)fluoranthene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(a)pyrene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/03/02	10/16/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	43-96	10/16/02	Acceptable
Fluoranthene-d10	89	20-131	10/16/02	Acceptable
Terphenyl-d14	92	13-146	10/16/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-W-98.0	**Units:**	ug/L
Lab Code:	K2207046-006	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.33**		0.020	1	10/03/02	10/14/02	KWG0207716	
2-Methylnaphthalene	**0.13**		0.020	1	10/03/02	10/14/02	KWG0207716	
Acenaphthylene	**0.045**		0.020	1	10/03/02	10/14/02	KWG0207716	
Acenaphthene	**0.45**		0.020	1	10/03/02	10/14/02	KWG0207716	
Dibenzofuran	**0.040**		0.020	1	10/03/02	10/14/02	KWG0207716	
Fluorene	**0.20**		0.020	1	10/03/02	10/14/02	KWG0207716	
Phenanthrene	**1.2**		0.020	1	10/03/02	10/14/02	KWG0207716	
Anthracene	**0.25**		0.020	1	10/03/02	10/14/02	KWG0207716	
Fluoranthene	**0.73**		0.020	1	10/03/02	10/14/02	KWG0207716	
Pyrene	**0.85**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benz(a)anthracene	**0.17**		0.020	1	10/03/02	10/14/02	KWG0207716	
Chrysene	**0.20**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(b)fluoranthene	**0.094**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(k)fluoranthene	**0.089**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(a)pyrene	**0.16**		0.020	1	10/03/02	10/14/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	**0.10**		0.020	1	10/03/02	10/14/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(g,h,i)perylene	**0.11**		0.020	1	10/03/02	10/14/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	43-96	10/14/02	Acceptable
Fluoranthene-d10	77	20-131	10/14/02	Acceptable
Terphenyl-d14	53	13-146	10/14/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/01/2002
Sample Matrix:	Water	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP-Dup	**Units:**	ug/L
Lab Code:	K2207046-007	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.39**		0.020	1	10/03/02	10/14/02	KWG0207716	
2-Methylnaphthalene	**0.14**		0.020	1	10/03/02	10/14/02	KWG0207716	
Acenaphthylene	**0.053**		0.020	1	10/03/02	10/14/02	KWG0207716	
Acenaphthene	**0.48**		0.020	1	10/03/02	10/14/02	KWG0207716	
Dibenzofuran	**0.043**		0.020	1	10/03/02	10/14/02	KWG0207716	
Fluorene	**0.24**		0.020	1	10/03/02	10/14/02	KWG0207716	
Phenanthrene	**1.5**		0.020	1	10/03/02	10/14/02	KWG0207716	
Anthracene	**0.34**		0.020	1	10/03/02	10/14/02	KWG0207716	
Fluoranthene	**0.95**		0.020	1	10/03/02	10/14/02	KWG0207716	
Pyrene	**1.2**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benz(a)anthracene	**0.22**		0.020	1	10/03/02	10/14/02	KWG0207716	
Chrysene	**0.26**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(b)fluoranthene	**0.13**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(k)fluoranthene	**0.12**		0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(a)pyrene	**0.20**		0.020	1	10/03/02	10/14/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	**0.11**		0.020	1	10/03/02	10/14/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/14/02	KWG0207716	
Benzo(g,h,i)perylene	**0.13**		0.020	1	10/03/02	10/14/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	43-96	10/14/02	Acceptable
Fluoranthene-d10	57	20-131	10/14/02	Acceptable
Terphenyl-d14	34	13-146	10/14/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207716-4	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
2-Methylnaphthalene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthylene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Acenaphthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenzofuran	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Fluorene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Phenanthrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benz(a)anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Chrysene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(b)fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(k)fluoranthene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(a)pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/03/02	10/15/02	KWG0207716	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	45	43-96	10/15/02	Acceptable
Fluoranthene-d10	68	20-131	10/15/02	Acceptable
Terphenyl-d14	79	13-146	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-S-15.0	**Units:**	ug/Kg
Lab Code:	K2207046-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**28**		5.4	1	10/14/02	10/23/02	KWG0208116	
2-Methylnaphthalene	**6.6**		5.4	1	10/14/02	10/23/02	KWG0208116	
Acenaphthylene	**75**		5.4	1	10/14/02	10/23/02	KWG0208116	
Acenaphthene	**5.7**		5.4	1	10/14/02	10/23/02	KWG0208116	
Dibenzofuran	ND	U	5.4	1	10/14/02	10/23/02	KWG0208116	
Fluorene	ND	U	5.4	1	10/14/02	10/23/02	KWG0208116	
Phenanthrene	**40**		5.4	1	10/14/02	10/23/02	KWG0208116	
Anthracene	**52**		5.4	1	10/14/02	10/23/02	KWG0208116	
Fluoranthene	**130**		5.4	1	10/14/02	10/23/02	KWG0208116	
Pyrene	**220**		5.4	1	10/14/02	10/23/02	KWG0208116	
Benz(a)anthracene	**220**		5.4	1	10/14/02	10/23/02	KWG0208116	
Chrysene	**250**		5.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(b)fluoranthene	**350**		5.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(k)fluoranthene	**250**		5.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(a)pyrene	**620**		5.4	1	10/14/02	10/23/02	KWG0208116	
Indeno(1,2,3-cd)pyrene	**490**		5.4	1	10/14/02	10/23/02	KWG0208116	
Dibenz(a,h)anthracene	**52**		5.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(g,h,i)perylene	**480**		5.4	1	10/14/02	10/23/02	KWG0208116	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	43-98	10/23/02	Acceptable
Fluoranthene-d10	91	52-108	10/23/02	Acceptable
Terphenyl-d14	94	61-122	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-S-23.0	**Units:**	ug/Kg
Lab Code:	K2207046-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	8200	D	710	100	10/14/02	10/24/02	KWG0208116	
2-Methylnaphthalene	11000	D	710	100	10/14/02	10/24/02	KWG0208116	
Acenaphthylene	8700	D	710	100	10/14/02	10/24/02	KWG0208116	
Acenaphthene	140000	D	7100	1000	10/14/02	10/24/02	KWG0208116	
Dibenzofuran	11000	D	710	100	10/14/02	10/24/02	KWG0208116	
Fluorene	87000	D	710	100	10/14/02	10/24/02	KWG0208116	
Phenanthrene	450000	D	7100	1000	10/14/02	10/24/02	KWG0208116	
Anthracene	110000	D	710	100	10/14/02	10/24/02	KWG0208116	
Fluoranthene	210000	D	7100	1000	10/14/02	10/24/02	KWG0208116	
Pyrene	230000	D	7100	1000	10/14/02	10/24/02	KWG0208116	
Benz(a)anthracene	74000	D	710	100	10/14/02	10/24/02	KWG0208116	
Chrysene	77000	D	710	100	10/14/02	10/24/02	KWG0208116	
Benzo(b)fluoranthene	42000	D	710	100	10/14/02	10/24/02	KWG0208116	
Benzo(k)fluoranthene	38000	D	710	100	10/14/02	10/24/02	KWG0208116	
Benzo(a)pyrene	83000	D	710	100	10/14/02	10/24/02	KWG0208116	
Indeno(1,2,3-cd)pyrene	45000	D	710	100	10/14/02	10/24/02	KWG0208116	
Dibenz(a,h)anthracene	5600	D	710	100	10/14/02	10/24/02	KWG0208116	
Benzo(g,h,i)perylene	42000	D	710	100	10/14/02	10/24/02	KWG0208116	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	0	43-98	10/24/02	Outside Control Limits
Fluoranthene-d10	0	52-108	10/24/02	Outside Control Limits
Terphenyl-d14	0	61-122	10/24/02	Outside Control Limits

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	09/30/2002
Sample Matrix:	Soil	**Date Received:**	10/02/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-S-30.0	**Units:**	ug/Kg
Lab Code:	K2207046-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
2-Methylnaphthalene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Acenaphthylene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Acenaphthene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Dibenzofuran	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Fluorene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Phenanthrene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Anthracene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Fluoranthene	**12**		7.4	1	10/14/02	10/23/02	KWG0208116	
Pyrene	**18**		7.4	1	10/14/02	10/23/02	KWG0208116	
Benz(a)anthracene	**10**		7.4	1	10/14/02	10/23/02	KWG0208116	
Chrysene	**13**		7.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(b)fluoranthene	**13**		7.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(k)fluoranthene	**10**		7.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(a)pyrene	**20**		7.4	1	10/14/02	10/23/02	KWG0208116	
Indeno(1,2,3-cd)pyrene	**14**		7.4	1	10/14/02	10/23/02	KWG0208116	
Dibenz(a,h)anthracene	ND	U	7.4	1	10/14/02	10/23/02	KWG0208116	
Benzo(g,h,i)perylene	**14**		7.4	1	10/14/02	10/23/02	KWG0208116	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	62	43-98	10/23/02	Acceptable
Fluoranthene-d10	66	52-108	10/23/02	Acceptable
Terphenyl-d14	89	61-122	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208116-9	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
2-Methylnaphthalene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Acenaphthylene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Acenaphthene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Dibenzofuran	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Fluorene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Phenanthrene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Anthracene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Fluoranthene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Pyrene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Benz(a)anthracene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Chrysene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Benzo(b)fluoranthene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Benzo(k)fluoranthene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Benzo(a)pyrene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Dibenz(a,h)anthracene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	
Benzo(g,h,i)perylene	ND	U	5.0	1	10/14/02	10/15/02	KWG0208116	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	43-98	10/15/02	Acceptable
Fluoranthene-d10	85	52-108	10/15/02	Acceptable
Terphenyl-d14	102	61-122	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207046

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP6-W-74.0	K2207046-004	57	64	55
GP4-W-98.0	K2207046-005	72	89	92
GP6-W-98.0	K2207046-006	75	77	53
GP-Dup	K2207046-007	62	57	34
Method Blank	KWG0207716-4	45	68	79
Batch QC	K2206980-010	75	79	79
Batch QCMS	KWG0207716-1	76	86	87
Batch QCDMS	KWG0207716-2	72	85	85
Lab Control Sample	KWG0207716-3	74	93	89

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-96
Sur2 =	Fluoranthene-d10	20-131
Sur3 =	Terphenyl-d14	13-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP6-S-15.0	K2207046-001	76	91	94
GP6-S-23.0	K2207046-002	0 D *	0 D #	0 D *
GP6-S-30.0	K2207046-003	62	66	89
Method Blank	KWG0208116-9	79	85	102
Batch QC	K2207111-008	74	81	96
GP6-S-15.0MS	KWG0208116-1	72	90	89
GP6-S-15.0DMS	KWG0208116-2	73	91	84
Batch QCMS	KWG0208116-3	68	83	84
Batch QCDMS	KWG0208116-4	76	86	88
Lab Control Sample	KWG0208116-7	56	64	70
Duplicate Lab Control Sample	KWG0208116-8	72	79	81

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-98
Sur2 =	Fluoranthene-d10	52-108
Sur3 =	Terphenyl-d14	61-122

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/03/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2206980-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207716

Analyte Name	Sample Result	Batch QCMS KWG0207716-1 Matrix Spike			Batch QCDMS KWG0207716-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	15	19.6	10.0	44	20.1E	10.0	49	30-97	3	30
2-Methylnaphthalene	19	23.9E	10.0	49	24.4E	10.0	54	33-96	2	30
Acenaphthylene	ND	7.92	10.0	79	8.01	10.0	80	39-104	1	30
Acenaphthene	0.45	7.13	10.0	67	7.29	10.0	68	34-99	2	30
Dibenzofuran	0.27	7.11	10.0	68	7.34	10.0	71	16-110	3	30
Fluorene	0.91	8.05	10.0	71	8.27	10.0	74	36-105	3	30
Phenanthrene	0.33	7.47	10.0	71	7.77	10.0	74	31-106	4	30
Anthracene	ND	8.08	10.0	81	8.23	10.0	82	24-111	2	30
Fluoranthene	ND	7.86	10.0	79	8.31	10.0	83	16-121	6	30
Pyrene	ND	8.24	10.0	82	8.80	10.0	88	11-125	6	30
Benz(a)anthracene	ND	8.52	10.0	85	8.97	10.0	90	14-125	5	30
Chrysene	ND	7.45	10.0	75	7.92	10.0	79	16-117	6	30
Benzo(b)fluoranthene	ND	7.98	10.0	80	8.77	10.0	88	16-124	9	30
Benzo(k)fluoranthene	ND	7.33	10.0	73	8.08	10.0	81	14-127	10	30
Benzo(a)pyrene	ND	9.22	10.0	92	9.66	10.0	97	19-126	5	30
Indeno(1,2,3-cd)pyrene	ND	8.52	10.0	85	8.53	10.0	85	10-137	0	30
Dibenz(a,h)anthracene	ND	7.69	10.0	77	7.78	10.0	78	16-124	1	30
Benzo(g,h,i)perylene	ND	7.49	10.0	75	7.56	10.0	76	15-119	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/14/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/24/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GP6-S-15.0	**Units:**	ug/Kg
Lab Code:	K2207046-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0208116

Analyte Name	Sample Result	GP6-S-15.0MS KWG0208116-1 Matrix Spike			GP6-S-15.0DMS KWG0208116-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	28	214	267	70	202	267	65	19-105	6	40
2-Methylnaphthalene	6.6	200	267	73	173	267	62	36-95	15	40
Acenaphthylene	75	288	267	80	357	267	106 *	40-99	21	40
Acenaphthene	5.7	207	267	75	189	267	69	33-102	9	40
Dibenzofuran	ND	202	267	75	195	267	73	38-100	3	40
Fluorene	ND	221	267	83	227	267	85	38-103	2	40
Phenanthrene	40	257	267	81	260	267	83	33-113	1	40
Anthracene	52	302	267	94	407	267	133 *	40-114	30	40
Fluoranthene	130	390	267	97	855	267	272 *	41-117	75 *	40
Pyrene	220	486	267	100	1180E	267	358 *	26-139	83 *	40
Benz(a)anthracene	220	527	267	115	1110E	267	335 *	32-134	72 *	40
Chrysene	250	500	267	94	1180E	267	349 *	27-135	81 *	40
Benzo(b)fluoranthene	350	641	267	108	1380E	267	383 *	31-136	73 *	40
Benzo(k)fluoranthene	250	412	267	61	893	267	241 *	32-131	74 *	40
Benzo(a)pyrene	620	935	267	118	2190E	267	586 *	26-146	80 *	40
Indeno(1,2,3-cd)pyrene	490	805	267	119	1570E	267	406 *	33-133	65 *	40
Dibenz(a,h)anthracene	52	300	267	93	358	267	115 *	42-114	18	40
Benzo(g,h,i)perylene	480	773	267	108	1480E	267	374 *	31-122	63 *	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00075

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/14/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/24/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/Kg
Lab Code:	K2207111-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0208116

		Batch QCMS KWG0208116-3 Matrix Spike			Batch QCDMS KWG0208116-4 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	ND	183	291	63	200	291	69	19-105	9	40
2-Methylnaphthalene	ND	189	291	65	209	291	72	36-95	10	40
Acenaphthylene	ND	212	291	73	237	291	81	40-99	11	40
Acenaphthene	ND	201	291	69	226	291	78	33-102	12	40
Dibenzofuran	ND	202	291	69	227	291	78	38-100	11	40
Fluorene	ND	219	291	75	242	291	83	38-103	10	40
Phenanthrene	ND	237	291	81	250	291	86	33-113	5	40
Anthracene	ND	262	291	90	276	291	95	40-114	5	40
Fluoranthene	ND	273	291	94	278	291	96	41-117	2	40
Pyrene	ND	277	291	95	291	291	100	26-139	5	40
Benz(a)anthracene	ND	293	291	101	301	291	103	32-134	3	40
Chrysene	ND	261	291	90	266	291	91	27-135	2	40
Benzo(b)fluoranthene	ND	280	291	96	287	291	99	31-136	2	40
Benzo(k)fluoranthene	ND	250	291	86	255	291	88	32-131	2	40
Benzo(a)pyrene	ND	307	291	105	314	291	108	26-146	3	40
Indeno(1,2,3-cd)pyrene	ND	241	291	83	255	291	88	33-133	6	40
Dibenz(a,h)anthracene	ND	215	291	74	227	291	78	42-114	6	40
Benzo(g,h,i)perylene	ND	217	291	75	230	291	79	31-122	6	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00076

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207046
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/03/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0207716

	Lab Control Sample KWG0207716-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	3.75	5.00	75	37-95
2-Methylnaphthalene	3.81	5.00	76	26-110
Acenaphthylene	4.37	5.00	87	44-103
Acenaphthene	3.90	5.00	78	41-97
Dibenzofuran	3.99	5.00	80	17-130
Fluorene	4.26	5.00	85	46-102
Phenanthrene	4.21	5.00	84	47-101
Anthracene	4.60	5.00	92	45-104
Fluoranthene	4.90	5.00	98	51-112
Pyrene	4.59	5.00	92	45-111
Benz(a)anthracene	5.10	5.00	102	50-111
Chrysene	4.53	5.00	91	51-108
Benzo(b)fluoranthene	4.89	5.00	98	54-114
Benzo(k)fluoranthene	4.35	5.00	87	51-117
Benzo(a)pyrene	5.27	5.00	105	51-119
Indeno(1,2,3-cd)pyrene	5.45	5.00	109	43-127
Dibenz(a,h)anthracene	4.96	5.00	99	47-119
Benzo(g,h,i)perylene	4.79	5.00	96	44-115

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207046
Date Extracted: 10/14/2002
Date Analyzed: 10/15/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0208116

	Lab Control Sample KWG0208116-7 Lab Control Spike			Duplicate Lab Control Sample KWG0208116-8 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	136	249	55	176	249	71	33-98	26	40
2-Methylnaphthalene	139	249	56	182	249	73	36-103	27	40
Acenaphthylene	153	249	61	198	249	80	41-102	26	40
Acenaphthene	144	249	58	187	249	75	41-97	26	40
Dibenzofuran	145	249	58	189	249	76	38-102	26	40
Fluorene	153	249	61	197	249	79	43-101	25	40
Phenanthrene	159	249	64	201	249	81	45-101	23	40
Anthracene	180	249	72	228	249	92	46-109	23	40
Fluoranthene	186	249	75	231	249	93	49-112	21	40
Pyrene	193	249	78	227	249	91	50-112	16	40
Benz(a)anthracene	194	249	78	238	249	96	52-114	21	40
Chrysene	190	249	76	233	249	93	54-109	20	40
Benzo(b)fluoranthene	206	249	83	255	249	102	54-115	21	40
Benzo(k)fluoranthene	198	249	80	247	249	99	54-115	22	40
Benzo(a)pyrene	224	249	90	285	249	115	54-120	24	40
Indeno(1,2,3-cd)pyrene	195	249	78	251	249	101	49-121	25	40
Dibenz(a,h)anthracene	181	249	73	233	249	94	48-114	25	40
Benzo(g,h,i)perylene	190	249	76	244	249	98	45-113	25	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services INC.
An Employee-Owned Company

November 5, 2002

Service Request No: K2207229

Dana Bayuk
Maul Foster & Alongi, Inc.
7223 N.E. Hazel Dell Avenue
Suite B
Vancouver, WA 98665

RE: Wacker/8128.01.04/3

Dear Dana:

Enclosed are the results of the sample(s) submitted to our laboratory on October 9, 2002. For your reference, these analyses have been assigned our service request number K2207229.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

for

Harvey Jacky
Project Chemist

HJ/cb

NELAC Accredited

1317 South 13th Avenue PO Box 479 Kelso Washington 98626
(360) 577-7222 (800) 695-7222x07 Fax (360) 636-1068

ACIL Seal of Excellence Laboratory

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Maul Foster and Alongi, Inc.	**Service Request No.:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Received:**	10/9/02
Sample Matrix:	Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

Sample Receipt

Three soil and two water samples were received for analysis at Columbia Analytical Services on 10/9/02. The following discrepancies were noted upon initial sample inspection. Samples GPS-W-68.0 and GPS-W-95.0 required addition of Sodium Hydroxide as preservative for the requested Cyanide analysis. The exceptions are also noted on the cooler receipt and preservation form included in this data package. Except as noted, the samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Holding Time Exceptions:
The analysis of samples GP5-S-13.0, GP5-S-21.0, and GP5-S-26.0 was initially performed on 10/17/02. The autosampler surrogate standard injection loop malfunctioned causing low surrogate and Lab Control Sample recoveries. The injection loop was cleaned and recalibrated. Efforts were made to reanalyze the samples as soon as possible after the analytical system was back in control. However, the reanalysis of the samples was performed 2 days past the recommended holding time. The results from the reanalysis are reported. The data is flagged to indicate the holding time violation.

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for Bromomethane in ICAL ID CAL2101. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 7.7%. The calibration meets the alternative evaluation criteria.

The primary evaluation criterion was exceeded for Methylene Chloride, Bromoform, and 1,2,3-Trichlorobenzene in ICAL ID CAL2113. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 11.0%. The calibration meets the alternative evaluation criteria.

Approved by _____ **Date** 11/14/02

Surrogate Exceptions:
The control criteria were exceeded for the following surrogate in LCS KWG0208327-3: 4-Bromofluorobenzene. The associated matrix spike recoveries of target compounds were in control, indicating the analysis was in control. The surrogate outlier is flagged accordingly. No further corrective action was appropriate.

Laboratory Control Sample (LCS) Exceptions:
The advisory criterion was exceeded for the following analytes in LCS KWG0208428-3. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

Elevated Method Reporting Limits:
Samples GPS5-W-95.0 required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL2040: 2,6-Dimethylnaphthalene, Acenaphthylene, 2,4,6-Tribromophenol, Pentachlorophenol, Anthracene, Carbazole, Fluoranthene, Benz(a)anthracene, Benzo(a)pyrene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 12.6%. The calibration meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria were exceeded for the Fluoranthene-d10 surrogate in sample GP5-S-21.0 due to matrix interferences:. Due to the presence of target and non-target background components that prevented adequate resolution of the surrogate, accurate quantitation was not possible. No further corrective action was appropriate.

Matrix Spike Recovery Exceptions:
The control criteria for matrix spike recoveries of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene for sample GP5-S-13.0 are not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

The matrix spike recoveries of Acenaphthylene, Phenanthrene, Anthracene, and Dibenz(a,h)anthracene for sample GP5-S-13.0DMS were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. No further corrective action was appropriate.

Relative Percent Difference (RPD) Exceptions:
The RPD for the replicate matrix spike analyses of Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, and Benzo(b)fluoranthene in sample GP5-S-13.0 were outside the normal CAS control limits. The variability in the results is attributed to the heterogeneous character of the sample. Standard mixing techniques were used, but were not sufficient for complete homogenization of this sample.

Approved by_____**Date**_____

Chain of Custody Documentation

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 • FAX (360) 636-1068

SR#: KLW 1224.

PAGE 1 OF 1 COC #

PROJECT NAME: Wacker

PROJECT NUMBER: 8128.01.04 /3

PROJECT MANAGER: Dana Bayuk, mFA Inc.

COMPANY/ADDRESS: 7223 NE Hazel Dell Ave, Suite B, Vancouver, WA 98665

PHONE #: 360-694-2691 FAX #: 360-906-1958

SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270 SIM	Volatile Organics 624☐ 8260	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1☐ 418.1☐ 1664 SGT☐ 1664 HEM☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	GC/MS-SIM PAH☐ Phenol☐ Phthalates☐	Metals, Total or Dissolved (See list below)	Cyanide	Hex-Chrom☐	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle) NH3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOC 9020☐ AOX 1650☐ 506☐	REMARKS
GP5-S-13.0	10/7/02	6:52		SOIL	2	X	X													
GP5-S-21.0	10/7/02	7:04		SOIL	2	X	X													
GP5-S-26.0	10/7/02	7:11		SOIL	2	X	X													
GP5-W-68.0	10/7/02	12:40		WATER	5	X	X									X				
GP5-W-95.0	10/8/02	12:00		WATER	5	X	X									X				

00008

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required

X II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

X V. EDD

INVOICE INFORMATION

P.O. #

Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard (10-15 working days)

___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

Received 2 Trips 10/9/02 mp

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date/Time: 10/8/02 15:00	Signature: [signature] Date/Time: 10/9/02	Signature: Date/Time:	Signature: Date/Time:
Printed Name: ANTHONY BHARWANI Firm: mFA, Inc	Printed Name: Firm: CAS 13 00	Printed Name: Firm:	Printed Name: Firm:

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client MPA Work Order K22 7229

Cooler received on 10/9/02 and opened on 10/9/02 by [illegible]

1. Were custody seals on outside of cooler? C (Y) N
   If yes, how many and where? 1F 1S
2. Were seals intact and signature & date correct? (Y) N
3. COC #
   Temperature of cooler(s) upon receipt: 1.2
   Temperature Blank: 5.5
4. Were custody papers properly filled out (ink, signed, etc.)? (Y) N
5. Type of packing material present STYRO, MESH
6. Did all bottles arrive in good condition (unbroken)? (Y) N
7. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (Y) N
8. Did all bottle labels and tags agree with custody papers? (Y) N
9. Were the correct types of bottles used for the tests indicated? (Y) N
10. Were all of the preserved bottles received at the lab with the appropriate pH? Y (N)
11. Were VOA vials checked for absence of air bubbles, and if present, noted below? (Y) N
12. Did the bottles originate from CAS/K or a branch laboratory? (Y) N
13. Are CWA Microbiology samples received with > ½ the 24 hr. hold time remaining from collection? ~~Y N~~
14. Was CL2/Residual negative? ~~Y N~~

Explain any discrepancies: * Received 2 Trips

RESOLUTION:

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials
GP5-W-68.0	NaOH	2ml	41143131	1LP		
GP5-W-95.0	NaOH	2ml	41143131	1LP		

Total Solids

SCOEPA00011414

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207229

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: WET

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
GP5-S-13.0	K2207229-001	10/07/2002	10/09/2002	10/10/2002	92.3	
GP5-S-21.0	K2207229-002	10/07/2002	10/09/2002	10/10/2002	94.0	
GP5-S-26.0	K2207229-003	10/07/2002	10/09/2002	10/10/2002	70.8	

Printed: 10/11/2002 16:13
U:\Stealth\Crystal.rpt\Solids.rpt

SuperSet Reference: W0207993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002
		Date Analyzed:	10/10/2002

Duplicate Sample Summary

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	WET
Test Notes:			

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
GP5-S-13.0	K2207229-001	92.3	92.5	92.4	<1	

General Chemistry Parameters

00013

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Collected: 10/7,8/02
Date Received: 10/9/02

Cyanide, Total

Prep Method: NONE
Analysis Method: 335.2
Test Notes:

Units: mg/L (ppm)
Basis: NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
GP5-W-68.0	K2207229-004	0.01	1	NA	10/18/02	0.63	
GP5-W-95.0	K2207229-005	0.01	1	NA	10/18/02	0.81	
Method Blank	K2207229-MB	0.01	1	NA	10/18/02	ND	

Approved By: _____ Date: 11/4/02

1A/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Collected: 10/7/02
Date Received: 10/9/02
Date Extracted: NA
Date Analyzed: 10/18/02

Duplicate Summary
Inorganic Parameters

Sample Name: GP5-W-68.0
Lab Code: K2207229-004DUP
Test Notes:

Units: mg/L (ppm)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Cyanide, Total	NONE	335.2	0.01	0.63	0.62	0.62	1	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

07229WET.MR1 - DUP 10/27/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/7/02
Sample Matrix:	Water	**Date Received:**	10/9/02
		Date Extracted:	NA
		Date Analyzed:	10/18/02

Matrix Spike Summary
Inorganic Parameters

Sample Name:	GP5-W-68.0	Units:	mg/L (ppm)
Lab Code:	K2207229-004MS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.01	0.10	0.63	0.72	95	75-125	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

07229WET.MR1 - MS 10/27/02

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/18/02

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name:	Lab Control Sample	Units:	mg/L (ppm)
Lab Code:	K2207229-LCS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.86	0.86	101	85-115	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/27/02

Volatile Organic Compounds
Method 8260

SCOEPA00011422

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Water	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-68.0	**Units:**	ug/L
Lab Code:	K2207229-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Chloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Vinyl Chloride	**54**		0.50	1	10/21/02	10/21/02	KWG0208428	
Bromomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Chloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Trichlorofluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Acetone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethene	**2.6**		0.50	1	10/21/02	10/21/02	KWG0208428	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Carbon Disulfide	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Methylene Chloride	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
trans-1,2-Dichloroethene	**1.5**		0.50	1	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethane	**0.79**		0.50	1	10/21/02	10/21/02	KWG0208428	
2-Butanone (MEK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
2,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
cis-1,2-Dichloroethene	**320**	D	5.0	10	10/18/02	10/18/02	KWG0208327	
Chloroform	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
Bromochloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
1,1-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Carbon Tetrachloride	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Benzene	**22**		0.50	1	10/21/02	10/21/02	KWG0208428	
Trichloroethene (TCE)	**2.6**		0.20	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromodichloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Dibromomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
2-Hexanone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Toluene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,2-Trichloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
1,3-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	

Comments:

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/07/2002
Sample Matrix:	Water	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-68.0	Units:	ug/L
Lab Code:	K2207229-004	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Dibromochloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Chlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Ethylbenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
m,p-Xylenes	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
o-Xylene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Styrene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromoform	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Isopropylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
n-Propylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
2-Chlorotoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
4-Chlorotoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
tert-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
sec-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,3-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
4-Isopropyltoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,4-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
n-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Naphthalene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Hexachlorobutadiene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Water	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-68.0	**Units:**	ug/L
Lab Code:	K2207229-004	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	113	78-124	10/21/02	Acceptable
Toluene-d8	109	87-118	10/21/02	Acceptable
4-Bromofluorobenzene	110	81-113	10/21/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/08/2002
Sample Matrix:	Water	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-95.0	**Units:**	ug/L
Lab Code:	K2207229-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Chloromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Vinyl Chloride	**2000**	D	25	50	10/21/02	10/21/02	KWG0208428	
Bromomethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Chloroethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Trichlorofluoromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Acetone	ND	U	1000	50	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethene	**36**	D	25	50	10/21/02	10/21/02	KWG0208428	
Methyl tert-Butyl Ether	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Carbon Disulfide	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Methylene Chloride	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
trans-1,2-Dichloroethene	**29**	D	25	50	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
2-Butanone (MEK)	ND	U	1000	50	10/21/02	10/21/02	KWG0208428	
2,2-Dichloropropane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
cis-1,2-Dichloroethene	**12000**	D	250	500	10/18/02	10/18/02	KWG0208327	
Chloroform	ND	U	25	50	10/21/02	10/21/02	KWG0208428	*
Bromochloromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,1,1-Trichloroethane (TCA)	ND	U	25	50	10/21/02	10/21/02	KWG0208428	*
1,1-Dichloropropene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Carbon Tetrachloride	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,2-Dichloroethane (EDC)	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Benzene	**210**	D	25	50	10/21/02	10/21/02	KWG0208428	
Trichloroethene (TCE)	**12000**	D	100	500	10/18/02	10/18/02	KWG0208327	
1,2-Dichloropropane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Bromodichloromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Dibromomethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
2-Hexanone	ND	U	1000	50	10/21/02	10/21/02	KWG0208428	
cis-1,3-Dichloropropene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Toluene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
trans-1,3-Dichloropropene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,1,2-Trichloroethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
4-Methyl-2-pentanone (MIBK)	ND	U	1000	50	10/21/02	10/21/02	KWG0208428	
1,3-Dichloropropane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	

Comments:

00022

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Collected: 10/08/2002
Date Received: 10/09/2002

Volatile Organic Compounds

Sample Name: GP5-W-95.0
Lab Code: K2207229-005

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Dibromochloromethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,2-Dibromoethane (EDB)	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
Chlorobenzene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,1,1,2-Tetrachloroethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Ethylbenzene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
m,p-Xylenes	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
o-Xylene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Styrene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Bromoform	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Isopropylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,1,2,2-Tetrachloroethane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichloropropane	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
Bromobenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
n-Propylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
2-Chlorotoluene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
4-Chlorotoluene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,3,5-Trimethylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
tert-Butylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,2,4-Trimethylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
sec-Butylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,3-Dichlorobenzene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
4-Isopropyltoluene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,4-Dichlorobenzene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
n-Butylbenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,2-Dichlorobenzene	ND	U	25	50	10/21/02	10/21/02	KWG0208428	
1,2-Dibromo-3-chloropropane	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,2,4-Trichlorobenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichlorobenzene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
Naphthalene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	
Hexachlorobutadiene	ND	U	100	50	10/21/02	10/21/02	KWG0208428	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/08/2002
Sample Matrix:	Water	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-95.0	Units:	ug/L
Lab Code:	K2207229-005	Basis:	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	113	78-124	10/21/02	Acceptable
Toluene-d8	110	87-118	10/21/02	Acceptable
4-Bromofluorobenzene	111	81-113	10/21/02	Acceptable

Comments:

00024

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/08/2002
Sample Matrix:	Water	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-W-95.0	Units:	ug/L
Lab Code:	K2207229-005	Basis:	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	113	78-124	10/21/02	Acceptable
Toluene-d8	110	87-118	10/21/02	Acceptable
4-Bromofluorobenzene	111	81-113	10/21/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208327-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Chloromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Vinyl Chloride	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Bromomethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Chloroethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Trichlorofluoromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Acetone	ND	U	20	1	10/18/02	10/18/02	KWG0208327	
1,1-Dichloroethene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Carbon Disulfide	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Methylene Chloride	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,1-Dichloroethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
2-Butanone (MEK)	ND	U	20	1	10/18/02	10/18/02	KWG0208327	
2,2-Dichloropropane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Chloroform	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Bromochloromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,1-Dichloropropene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Carbon Tetrachloride	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Benzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Trichloroethene (TCE)	ND	U	0.20	1	10/18/02	10/18/02	KWG0208327	
1,2-Dichloropropane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Bromodichloromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Dibromomethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
2-Hexanone	ND	U	20	1	10/18/02	10/18/02	KWG0208327	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Toluene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,1,2-Trichloroethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/18/02	10/18/02	KWG0208327	
1,3-Dichloropropane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/L
Lab Code:	KWG0208327-4	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Dibromochloromethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
Chlorobenzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Ethylbenzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
m,p-Xylenes	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
o-Xylene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Styrene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Bromoform	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Isopropylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,2,3-Trichloropropane	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
Bromobenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
n-Propylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
2-Chlorotoluene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
4-Chlorotoluene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
tert-Butylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
sec-Butylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,3-Dichlorobenzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
4-Isopropyltoluene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,4-Dichlorobenzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
n-Butylbenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,2-Dichlorobenzene	ND	U	0.50	1	10/18/02	10/18/02	KWG0208327	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
Naphthalene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	
Hexachlorobutadiene	ND	U	2.0	1	10/18/02	10/18/02	KWG0208327	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208327-4	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	111	78-124	10/18/02	Acceptable
Toluene-d8	110	87-118	10/18/02	Acceptable
4-Bromofluorobenzene	109	81-113	10/18/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

:lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
'roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/L
ab Code:	KWG0208428-4	Basis:	NA
xtraction Method:	EPA 5030B	Level:	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
)ichlorodifluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:hloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
/inyl Chloride	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
3romomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:hloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
'richlorofluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
\cetone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
,1-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
/lethyl tert-Butyl Ether	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:arbon Disulfide	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
/lethylene Chloride	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
rans-1,2-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
,1-Dichloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:-Butanone (MEK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
:,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
'is-1,2-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:hloroform	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
3romochloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
.1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
,1-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
:arbon Tetrachloride	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
,2-Dichloroethane (EDC)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
3enzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Trichloroethene (TCE)	ND	U	0.20	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
3romodichloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
)ibromomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
2-Hexanone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
:is-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Toluene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
rans-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,2-Trichloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
1,3-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	

Comments:

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Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0208428-4

Units: ug/L
Basis: NA

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Dibromochloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Chlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Ethylbenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
m,p-Xylenes	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
o-Xylene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Styrene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromoform	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Isopropylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
n-Propylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
2-Chlorotoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
4-Chlorotoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
tert-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
sec-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,3-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
4-Isopropyltoluene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,4-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
n-Butylbenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichlorobenzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Naphthalene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
Hexachlorobutadiene	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/L
Lab Code:	KWG0208428-4	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Chloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Vinyl Chloride	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Chloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Trichlorofluoromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Acetone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Carbon Disulfide	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Methylene Chloride	ND	U	2.0	1	10/21/02	10/21/02	KWG0208428	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1-Dichloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
2-Butanone (MEK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
2,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Chloroform	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
Bromochloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	*
1,1-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Carbon Tetrachloride	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Benzene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Trichloroethene (TCE)	ND	U	0.20	1	10/21/02	10/21/02	KWG0208428	
1,2-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Bromodichloromethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Dibromomethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
2-Hexanone	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
Toluene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
1,1,2-Trichloroethane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/21/02	10/21/02	KWG0208428	
1,3-Dichloropropane	ND	U	0.50	1	10/21/02	10/21/02	KWG0208428	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208428-4	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	114	78-124	10/21/02	Acceptable
Toluene-d8	110	87-118	10/21/02	Acceptable
4-Bromofluorobenzene	109	81-113	10/21/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207229
Date Collected: 10/07/2002
Date Received: 10/09/2002

Volatile Organic Compounds

Sample Name: GP5-S-13.0
Lab Code: K2207229-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Chloromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Vinyl Chloride	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Bromomethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Chloroethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Trichlorofluoromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Acetone	ND	U	54	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Methyl tert-Butyl Ether	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Carbon Disulfide	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Methylene Chloride	ND	U	11	1	10/23/02	10/23/02	KWG0208469	*
trans-1,2-Dichloroethene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
2-Butanone (MEK)	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
2,2-Dichloropropane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
cis-1,2-Dichloroethene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Chloroform	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Bromochloromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,1,1-Trichloroethane (TCA)	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloropropene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Carbon Tetrachloride	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloroethane (EDC)	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Benzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Trichloroethene (TCE)	ND	U	2.2	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloropropane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Bromodichloromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Dibromomethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
2-Hexanone	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
cis-1,3-Dichloropropene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Toluene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
trans-1,3-Dichloropropene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,1,2-Trichloroethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
4-Methyl-2-pentanone (MIBK)	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichloropropane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/07/2002
Sample Matrix:	Soil	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-13.0	Units:	ug/Kg
Lab Code:	K2207229-001	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Dibromochloromethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromoethane (EDB)	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
Chlorobenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,1,1,2-Tetrachloroethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Ethylbenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
m,p-Xylenes	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
o-Xylene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Styrene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Bromoform	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Isopropylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,1,2,2-Tetrachloroethane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichloropropane	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
Bromobenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
n-Propylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
2-Chlorotoluene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
4-Chlorotoluene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,3,5-Trimethylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
tert-Butylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trimethylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
sec-Butylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichlorobenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
4-Isopropyltoluene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,4-Dichlorobenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
n-Butylbenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichlorobenzene	ND	U	5.4	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromo-3-chloropropane	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trichlorobenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichlorobenzene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
Naphthalene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*
Hexachlorobutadiene	ND	U	22	1	10/23/02	10/23/02	KWG0208469	*

* See Case Narrative

Comments:

00032

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-13.0	**Units:**	ug/Kg
Lab Code:	K2207229-001	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	84-121	10/23/02	Acceptable
Toluene-d8	95	80-125	10/23/02	Acceptable
4-Bromofluorobenzene	110	80-123	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-21.0	**Units:**	ug/Kg
Lab Code:	K2207229-002	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Chloromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Vinyl Chloride	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Bromomethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Chloroethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Trichlorofluoromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Acetone	ND	U	52	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Methyl tert-Butyl Ether	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Carbon Disulfide	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Methylene Chloride	ND	U	11	1	10/23/02	10/23/02	KWG0208469	*
trans-1,2-Dichloroethene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
2-Butanone (MEK)	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
2,2-Dichloropropane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
cis-1,2-Dichloroethene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Chloroform	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Bromochloromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,1,1-Trichloroethane (TCA)	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloropropene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Carbon Tetrachloride	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloroethane (EDC)	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Benzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Trichloroethene (TCE)	ND	U	2.1	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloropropane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Bromodichloromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Dibromomethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
2-Hexanone	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
cis-1,3-Dichloropropene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Toluene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
trans-1,3-Dichloropropene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,1,2-Trichloroethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
4-Methyl-2-pentanone (MIBK)	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichloropropane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-21.0	**Units:**	ug/Kg
Lab Code:	K2207229-002	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Dibromochloromethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromoethane (EDB)	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
Chlorobenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,1,1,2-Tetrachloroethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Ethylbenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
m,p-Xylenes	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
o-Xylene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Styrene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Bromoform	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Isopropylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,1,2,2-Tetrachloroethane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichloropropane	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
Bromobenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
n-Propylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
2-Chlorotoluene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
4-Chlorotoluene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,3,5-Trimethylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
tert-Butylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trimethylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
sec-Butylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichlorobenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
4-Isopropyltoluene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,4-Dichlorobenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
n-Butylbenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1;2-Dichlorobenzene	ND	U	5.2	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromo-3-chloropropane	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trichlorobenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichlorobenzene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
Naphthalene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*
Hexachlorobutadiene	ND	U	21	1	10/23/02	10/23/02	KWG0208469	*

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/07/2002
Sample Matrix:	Soil	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-21.0	Units:	ug/Kg
Lab Code:	K2207229-002	Basis:	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	97	84-121	10/23/02	Acceptable
Toluene-d8	98	80-125	10/23/02	Acceptable
4-Bromofluorobenzene	103	80-123	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-26.0	**Units:**	ug/Kg
Lab Code:	K2207229-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Chloromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Vinyl Chloride	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Bromomethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Chloroethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Trichlorofluoromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Acetone	**120**		71	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Methyl tert-Butyl Ether	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Carbon Disulfide	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Methylene Chloride	ND	U	15	1	10/23/02	10/23/02	KWG0208469	*
trans-1,2-Dichloroethene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloroethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
2-Butanone (MEK)	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
2,2-Dichloropropane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
cis-1,2-Dichloroethene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Chloroform	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Bromochloromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,1,1-Trichloroethane (TCA)	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,1-Dichloropropene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Carbon Tetrachloride	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloroethane (EDC)	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Benzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Trichloroethene (TCE)	ND	U	2.9	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichloropropane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Bromodichloromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Dibromomethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
2-Hexanone	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
cis-1,3-Dichloropropene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Toluene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
trans-1,3-Dichloropropene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,1,2-Trichloroethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
4-Methyl-2-pentanone (MIBK)	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichloropropane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	10/07/2002
Sample Matrix:	Soil	Date Received:	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-26.0	Units:	ug/Kg
Lab Code:	K2207229-003	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Dibromochloromethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromoethane (EDB)	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
Chlorobenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,1,1,2-Tetrachloroethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Ethylbenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
m,p-Xylenes	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
o-Xylene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Styrene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Bromoform	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Isopropylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,1,2,2-Tetrachloroethane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichloropropane	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
Bromobenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
n-Propylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
2-Chlorotoluene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
4-Chlorotoluene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,3,5-Trimethylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
tert-Butylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trimethylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
sec-Butylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,3-Dichlorobenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
4-Isopropyltoluene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,4-Dichlorobenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
n-Butylbenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dichlorobenzene	ND	U	7.1	1	10/23/02	10/23/02	KWG0208469	*
1,2-Dibromo-3-chloropropane	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,2,4-Trichlorobenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
1,2,3-Trichlorobenzene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
Naphthalene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*
Hexachlorobutadiene	ND	U	29	1	10/23/02	10/23/02	KWG0208469	*

See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Volatile Organic Compounds

Sample Name:	GP5-S-26.0	**Units:**	ug/Kg
Lab Code:	K2207229-003	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	98	84-121	10/23/02	Acceptable
Toluene-d8	98	80-125	10/23/02	Acceptable
4-Bromofluorobenzene	100	80-123	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG0208469-3	Basis:	Dry
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Chloromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Vinyl Chloride	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Bromomethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Chloroethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Trichlorofluoromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Acetone	ND	U	50	1	10/23/02	10/23/02	KWG0208469	
1,1-Dichloroethene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Methyl tert-Butyl Ether	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Carbon Disulfide	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Methylene Chloride	ND	U	10	1	10/23/02	10/23/02	KWG0208469	
trans-1,2-Dichloroethene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,1-Dichloroethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
2-Butanone (MEK)	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,2-Dichloropropane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
cis-1,2-Dichloroethene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Chloroform	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Bromochloromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,1-Dichloropropene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Carbon Tetrachloride	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,2-Dichloroethane (EDC)	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Benzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Trichloroethene (TCE)	ND	U	2.0	1	10/23/02	10/23/02	KWG0208469	
1,2-Dichloropropane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Bromodichloromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Dibromomethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
2-Hexanone	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
cis-1,3-Dichloropropene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Toluene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
trans-1,3-Dichloropropene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,1,2-Trichloroethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,3-Dichloropropane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	

Comments:

00040

SCOEPA00011446

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207229
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG0208469-3

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030B
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Dibromochloromethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,2-Dibromoethane (EDB)	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
Chlorobenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Ethylbenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
m,p-Xylenes	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
o-Xylene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Styrene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Bromoform	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Isopropylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,2,3-Trichloropropane	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
Bromobenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
n-Propylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
2-Chlorotoluene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
4-Chlorotoluene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,3,5-Trimethylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
tert-Butylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,2,4-Trimethylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
sec-Butylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,3-Dichlorobenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
4-Isopropyltoluene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,4-Dichlorobenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
n-Butylbenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,2-Dichlorobenzene	ND	U	5.0	1	10/23/02	10/23/02	KWG0208469	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,2,4-Trichlorobenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
1,2,3-Trichlorobenzene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
Naphthalene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	
Hexachlorobutadiene	ND	U	20	1	10/23/02	10/23/02	KWG0208469	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG0208469-3	Basis:	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	96	84-121	10/23/02	Acceptable
Toluene-d8	95	80-125	10/23/02	Acceptable
4-Bromofluorobenzene	98	80-123	10/23/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	
GP5-W-68.0	K2207229-004	113	109	110	
GP5-W-95.0	K2207229-005	113	110	111	
Method Blank	KWG0208327-4	111	110	109	
Method Blank	KWG0208428-4	114	110	109	
GP5-W-95.0MS	KWG0208428-1	112	109	112	
GP5-W-95.0DMS	KWG0208428-2	113	110	113	
Lab Control Sample	KWG0208327-3	112	110	114	*
Lab Control Sample	KWG0208428-3	113	110	112	

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	78-124
Sur2 =	Toluene-d8	87-118
Sur3 =	4-Bromofluorobenzene	81-113

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient: Maul Foster & Alongi, Inc.
roject: Wacker/8128.01.04/3
ample Matrix: Soil

Service Request: K2207229

Surrogate Recovery Summary
Volatile Organic Compounds

xtraction Method: EPA 5030A
nalysis Method: 8260B

Units: PERCENT
Level: Low

ample Name	Lab Code	Sur1	Sur2	Sur3
P5-S-13.0	K2207229-001	94	95	110
P5-S-21.0	K2207229-002	97	98	103
P5-S-26.0	K2207229-003	98	98	100
lethod Blank	KWG0208469-3	96	95	98
ab Control Sample	KWG0208469-1	94	98	104
uplicate Lab Control Sample	KWG0208469-2	101	100	104

urrogate Recovery Control Limits (%)

ur1 =	Dibromofluoromethane	84-121
ur2 =	Toluene-d8	80-125
ur3 =	4-Bromofluorobenzene	80-123

esults flagged with an asterisk (*) indicate values outside control criteria.
esults flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/21/2002
Sample Matrix:	Water	**Date Analyzed:**	10/21/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	GP5-W-95.0	**Units:**	ug/L
Lab Code:	K2207229-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG0208428

		GP5-W-95.0MS KWG0208428-1 Matrix Spike			GP5-W-95.0DMS KWG0208428-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,1-Dichloroethene	36	5320	5000	106	4920	5000	98	67-157	8	30
Benzene	210	6040	5000	116	5820	5000	112	76-138	4	30
Trichloroethene (TCE)	12000	18100	5000	116	17200	5000	97	66-149	5	30
Toluene	ND	5840	5000	117	5550	5000	111	82-131	5	30
Chlorobenzene	ND	5530	5000	111	5320	5000	106	70-131	4	30
1,2-Dichlorobenzene	ND	5150	5000	103	4960	5000	99	70-126	4	30
Naphthalene	ND	5120	5000	102	5080	5000	102	50-149	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
roject:	Wacker/8128.01.04/3	Date Extracted:	10/18/2002
ample Matrix:	Water	Date Analyzed:	10/18/2002

Lab Control Spike Summary
Volatile Organic Compounds

xtraction Method:	EPA 5030B	Units:	ug/L
nalysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208327

	Lab Control Sample KWG0208327-3 Lab Control Spike			
nalyte Name	Result	Expected	%Rec	%Rec Limits
ichlorodifluoromethane	11.3	10.0	113	33-189
hloromethane	9.01	10.0	90	66-128
inyl Chloride	11.5	10.0	115	76-135
romomethane	7.68	10.0	77	30-188
hloroethane	10.6	10.0	106	79-131
richlorofluoromethane	11.0	10.0	110	73-127
cetone	52.8	50.0	106	60-157
,1-Dichloroethene	10.7	10.0	107	79-137
lethyl tert-Butyl Ether	9.31	10.0	93	78-128
arbon Disulfide	21.0	20.0	105	68-118
lethylene Chloride	10.8	10.0	108	68-135
ans-1,2-Dichloroethene	10.9	10.0	109	88-127
,1-Dichloroethane	11.8	10.0	118	89-133
-Butanone (MEK)	55.4	50.0	111	78-144
,2-Dichloropropane	9.88	10.0	99	71-138
is-1,2-Dichloroethene	10.1	10.0	101	90-126
hloroform	11.7	10.0	117	88-117
romochloromethane	11.4	10.0	114	80-133
,1,1-Trichloroethane (TCA)	12.0	10.0	120	83-122
,1-Dichloropropene	11.7	10.0	117	87-137
arbon Tetrachloride	12.2	10.0	122	87-131
,2-Dichloroethane (EDC)	11.4	10.0	114	73-130
enzene	11.5	10.0	115	90-120
richloroethene (TCE)	11.7	10.0	117	83-131
,2-Dichloropropane	11.4	10.0	114	87-121
romodichloromethane	11.0	10.0	110	84-114
ibromomethane	11.6	10.0	116	76-130
-Hexanone	49.7	50.0	99	68-135
is-1,3-Dichloropropene	11.3	10.0	113	90-126
oluene	11.7	10.0	117	89-119
rans-1,3-Dichloropropene	9.89	10.0	99	77-113
,1,2-Trichloroethane	10.6	10.0	106	81-116
-Methyl-2-pentanone (MIBK)	53.6	50.0	107	79-138
,3-Dichloropropane	11.0	10.0	110	76-129
etrachloroethene (PCE)	11.0	10.0	110	82-123
ibromochloromethane	10.7	10.0	107	83-119

esults flagged with an asterisk (*) indicate values outside control criteria.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Extracted: 10/18/2002
Date Analyzed: 10/18/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0208327

Analyte Name	Lab Control Sample KWG0208327-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	11.1	10.0	111	74-130
Chlorobenzene	11.0	10.0	110	86-115
1,1,1,2-Tetrachloroethane	11.1	10.0	111	88-118
Ethylbenzene	11.4	10.0	114	89-124
m,p-Xylenes	22.9	20.0	114	90-122
o-Xylene	11.4	10.0	114	88-126
Styrene	11.5	10.0	115	91-123
Bromoform	10.9	10.0	109	76-125
Isopropylbenzene	10.8	10.0	108	82-123
1,1,2,2-Tetrachloroethane	10.3	10.0	103	78-117
1,2,3-Trichloropropane	11.1	10.0	111	75-127
Bromobenzene	10.4	10.0	104	76-129
n-Propylbenzene	10.9	10.0	109	83-128
2-Chlorotoluene	10.5	10.0	105	74-131
4-Chlorotoluene	10.5	10.0	105	87-119
1,3,5-Trimethylbenzene	10.9	10.0	109	85-128
tert-Butylbenzene	11.0	10.0	110	83-129
1,2,4-Trimethylbenzene	11.0	10.0	110	88-129
sec-Butylbenzene	11.2	10.0	112	84-133
1,3-Dichlorobenzene	10.4	10.0	104	87-116
4-Isopropyltoluene	10.5	10.0	105	81-126
1,4-Dichlorobenzene	10.5	10.0	105	86-115
n-Butylbenzene	10.3	10.0	103	79-134
1,2-Dichlorobenzene	10.3	10.0	103	85-113
1,2-Dibromo-3-chloropropane	9.64	10.0	96	55-136
1,2,4-Trichlorobenzene	9.43	10.0	94	76-130
1,2,3-Trichlorobenzene	9.77	10.0	98	70-134
Naphthalene	9.80	10.0	98	71-137
Hexachlorobutadiene	10.2	10.0	102	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
Project:	Wacker/8128.01.04/3	Date Extracted:	10/21/2002
Sample Matrix:	Water	Date Analyzed:	10/21/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	Units:	ug/L
Analysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208428

Analyte Name	Lab Control Sample KWG0208428-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dichlorodifluoromethane	11.7	10.0	117	33-189
Chloromethane	8.93	10.0	89	66-128
Vinyl Chloride	12.0	10.0	120	76-135
Bromomethane	8.50	10.0	85	30-188
Chloroethane	10.8	10.0	108	79-131
Trichlorofluoromethane	11.3	10.0	113	73-127
Acetone	51.3	50.0	103	60-157
1,1-Dichloroethene	10.7	10.0	107	79-137
Methyl tert-Butyl Ether	9.10	10.0	91	78-128
Carbon Disulfide	21.9	20.0	109	68-118
Methylene Chloride	11.4	10.0	114	68-135
trans-1,2-Dichloroethene	11.3	10.0	113	88-127
1,1-Dichloroethane	12.2	10.0	122	89-133
2-Butanone (MEK)	54.1	50.0	108	78-144
1,2-Dichloropropane	11.9	10.0	119	71-138
cis-1,2-Dichloroethene	10.4	10.0	104	90-126
Chloroform	11.9	10.0	119 *	88-117
Bromochloromethane	12.0	10.0	120	80-133
1,1,1-Trichloroethane (TCA)	12.3	10.0	123 *	83-122
1,1-Dichloropropene	11.9	10.0	119	87-137
Carbon Tetrachloride	13.0	10.0	130	87-131
1,2-Dichloroethane (EDC)	11.7	10.0	117	73-130
Benzene	11.9	10.0	119	90-120
Trichloroethene (TCE)	12.1	10.0	121	83-131
1,2-Dichloropropane	11.5	10.0	115	87-121
Bromodichloromethane	11.3	10.0	113	84-114
Dibromomethane	11.7	10.0	117	76-130
2-Hexanone	46.2	50.0	92	68-135
cis-1,3-Dichloropropene	11.6	10.0	116	90-126
Toluene	11.9	10.0	119	89-119
trans-1,3-Dichloropropene	9.70	10.0	97	77-113
1,1,2-Trichloroethane	10.4	10.0	104	81-116
4-Methyl-2-pentanone (MIBK)	52.3	50.0	105	79-138
1,3-Dichloropropane	10.8	10.0	108	76-129
Tetrachloroethene (PCE)	11.6	10.0	116	82-123
Dibromochloromethane	11.4	10.0	114	83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00048

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229
Date Extracted: 10/21/2002
Date Analyzed: 10/21/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0208428

Analyte Name	Lab Control Sample KWG0208428-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	11.0	10.0	110	74-130
Chlorobenzene	11.3	10.0	113	86-115
1,1,1,2-Tetrachloroethane	11.2	10.0	112	88-118
Ethylbenzene	11.8	10.0	118	89-124
m,p-Xylenes	23.6	20.0	118	90-122
o-Xylene	11.6	10.0	116	88-126
Styrene	11.7	10.0	117	91-123
Bromoform	11.9	10.0	119	76-125
Isopropylbenzene	11.1	10.0	111	82-123
1,1,2,2-Tetrachloroethane	9.82	10.0	98	78-117
1,2,3-Trichloropropane	10.8	10.0	108	75-127
Bromobenzene	10.6	10.0	106	76-129
n-Propylbenzene	10.8	10.0	108	83-128
2-Chlorotoluene	10.6	10.0	106	74-131
4-Chlorotoluene	10.4	10.0	104	87-119
1,3,5-Trimethylbenzene	11.1	10.0	111	85-128
tert-Butylbenzene	11.1	10.0	111	83-129
1,2,4-Trimethylbenzene	11.4	10.0	114	88-129
sec-Butylbenzene	11.6	10.0	116	84-133
1,3-Dichlorobenzene	10.7	10.0	107	87-116
4-Isopropyltoluene	10.9	10.0	109	81-126
1,4-Dichlorobenzene	10.8	10.0	108	86-115
n-Butylbenzene	10.7	10.0	107	79-134
1,2-Dichlorobenzene	10.5	10.0	105	85-113
1,2-Dibromo-3-chloropropane	10.3	10.0	103	55-136
1,2,4-Trichlorobenzene	9.97	10.0	100	76-130
1,2,3-Trichlorobenzene	10.3	10.0	103	70-134
Naphthalene	10.0	10.0	100	71-137
Hexachlorobutadiene	11.9	10.0	119	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00049

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207229
roject:	Wacker/8128.01.04/3	Date Extracted:	10/23/2002
ample Matrix:	Soil	Date Analyzed:	10/23/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

xtraction Method:	EPA 5030B	Units:	ug/Kg
nalysis Method:	8260B	Basis:	Dry
		Level:	Low
		Extraction Lot:	KWG0208469

	Lab Control Sample KWG0208469-1 Lab Control Spike			Duplicate Lab Control Sample KWG0208469-2 Duplicate Lab Control Spike					
nalyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
ichlorodifluoromethane	53.0	50.0	106	51.4	50.0	103	46-130	3	40
hloromethane	51.1	50.0	102	47.1	50.0	94	55-118	8	40
inyl Chloride	56.2	50.0	112	52.3	50.0	105	64-137	7	40
romomethane	52.2	50.0	104	47.1	50.0	94	58-147	10	40
hloroethane	56.3	50.0	113	45.7	50.0	91	60-137	21	40
richlorofluoromethane	49.5	50.0	99	46.3	50.0	93	58-125	7	40
cetone	205	250	82	202	250	81	59-111	2	40
,1-Dichloroethene	50.8	50.0	102	48.0	50.0	96	76-135	6	40
lethyl tert-Butyl Ether	47.4	50.0	95	45.9	50.0	92	71-143	3	40
arbon Disulfide	99.6	100	100	94.6	100	95	70-101	5	40
lethylene Chloride	44.4	50.0	89	43.1	50.0	86	76-117	3	40
ans-1,2-Dichloroethene	53.2	50.0	106	49.3	50.0	99	77-132	8	40
,1-Dichloroethane	52.4	50.0	105	49.9	50.0	100	84-122	5	40
-Butanone (MEK)	236	250	95	247	250	99	76-133	4	40
,2-Dichloropropane	53.7	50.0	107	48.3	50.0	97	74-134	11	40
is-1,2-Dichloroethene	50.0	50.0	100	49.7	50.0	99	79-123	1	40
hloroform	49.4	50.0	99	49.9	50.0	100	74-122	1	40
romochloromethane	49.6	50.0	99	51.1	50.0	102	77-131	3	40
,1,1-Trichloroethane (TCA)	49.8	50.0	100	46.2	50.0	92	66-137	8	40
,1-Dichloropropene	52.1	50.0	104	49.6	50.0	99	81-130	5	40
arbon Tetrachloride	52.6	50.0	105	48.1	50.0	96	70-142	9	40
,2-Dichloroethane (EDC)	46.4	50.0	93	47.2	50.0	94	67-132	2	40
enzene	54.4	50.0	109	47.6	50.0	95	84-115	13	40
richloroethene (TCE)	53.9	50.0	108	49.9	50.0	100	78-128	8	40
,2-Dichloropropane	51.4	50.0	103	46.0	50.0	92	84-114	11	40
romodichloromethane	46.4	50.0	93	43.8	50.0	88	72-120	6	40
ibromomethane	47.5	50.0	95	50.0	50.0	100	75-124	5	40
-Hexanone	246	250	99	246	250	99	75-125	0	40
is-1,3-Dichloropropene	50.0	50.0	100	50.2	50.0	100	88-122	0	40
oluene	48.7	50.0	97	47.1	50.0	94	80-119	3	40
ans-1,3-Dichloropropene	48.3	50.0	97	45.1	50.0	90	73-116	7	40
,1,2-Trichloroethane	49.3	50.0	99	47.2	50.0	94	76-115	4	40
-Methyl-2-pentanone (MIBK)	235	250	94	267	250	107	78-122	13	40
,3-Dichloropropane	50.7	50.0	101	46.2	50.0	92	74-111	9	40
etrachloroethene (PCE)	55.9	50.0	112	52.6	50.0	105	71-129	6	40
ibromochloromethane	48.2	50.0	96	46.6	50.0	93	79-121	3	40

esults flagged with an asterisk (*) indicate values outside control criteria.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207229
Date Extracted: 10/23/2002
Date Analyzed: 10/23/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0208469

	Lab Control Sample KWG0208469-1 Lab Control Spike			Duplicate Lab Control Sample KWG0208469-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,2-Dibromoethane (EDB)	51.3	50.0	103	50.8	50.0	102	80-121	1	40
Chlorobenzene	54.3	50.0	109	50.3	50.0	101	77-117	8	40
1,1,1,2-Tetrachloroethane	53.0	50.0	106	51.7	50.0	103	77-126	2	40
Ethylbenzene	57.1	50.0	114	53.1	50.0	106	78-125	7	40
m,p-Xylenes	107	100	107	103	100	103	74-122	3	40
o-Xylene	56.5	50.0	113	53.3	50.0	107	76-123	6	40
Styrene	56.9	50.0	114	53.5	50.0	107	78-127	6	40
Bromoform	47.6	50.0	95	48.4	50.0	97	75-139	2	40
Isopropylbenzene	54.2	50.0	108	49.4	50.0	99	71-123	9	40
1,1,2,2-Tetrachloroethane	44.8	50.0	90	46.3	50.0	93	72-120	3	40
1,2,3-Trichloropropane	48.2	50.0	96	53.8	50.0	108	73-133	11	40
Bromobenzene	51.4	50.0	103	53.1	50.0	106	69-132	3	40
n-Propylbenzene	55.7	50.0	111	57.1	50.0	114	70-123	3	40
2-Chlorotoluene	54.2	50.0	108	52.1	50.0	104	69-123	4	40
4-Chlorotoluene	53.4	50.0	107	52.3	50.0	105	70-123	2	40
1,3,5-Trimethylbenzene	57.3	50.0	115	54.4	50.0	109	70-127	5	40
tert-Butylbenzene	55.5	50.0	111	49.8	50.0	100	69-127	11	40
1,2,4-Trimethylbenzene	56.7	50.0	113	53.9	50.0	108	73-138	5	40
sec-Butylbenzene	58.2	50.0	116	52.3	50.0	105	70-129	11	40
1,3-Dichlorobenzene	54.6	50.0	109	53.2	50.0	106	72-122	3	40
4-Isopropyltoluene	57.0	50.0	114	50.5	50.0	101	71-119	12	40
1,4-Dichlorobenzene	52.9	50.0	106	52.8	50.0	106	74-119	0	40
n-Butylbenzene	59.0	50.0	118	54.8	50.0	110	69-120	7	40
1,2-Dichlorobenzene	52.2	50.0	104	49.4	50.0	99	72-121	6	40
1,2-Dibromo-3-chloropropane	48.5	50.0	97	46.6	50.0	93	71-125	4	40
1,2,4-Trichlorobenzene	56.1	50.0	112	55.9	50.0	112	68-130	0	40
1,2,3-Trichlorobenzene	52.1	50.0	104	53.5	50.0	107	70-127	3	40
Naphthalene	50.3	50.0	101	47.1	50.0	94	74-127	7	40
Hexachlorobutadiene	54.7	50.0	109	53.7	50.0	107	60-145	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Water	**Date Received:**	10/09/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-W-68.0	**Units:**	ug/L
Lab Code:	K2207229-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
2-Methylnaphthalene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenzofuran	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluorene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Phenanthrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluoranthene	**0.026**		0.020	1	10/10/02	10/19/02	KWG0207981	
Pyrene	**0.033**		0.020	1	10/10/02	10/19/02	KWG0207981	
Benz(a)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Chrysene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(b)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(k)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(a)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	43	43-96	10/19/02	Acceptable
Fluoranthene-d10	49	20-131	10/19/02	Acceptable
Terphenyl-d14	46	13-146	10/19/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/08/2002
Sample Matrix:	Water	**Date Received:**	10/09/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-W-95.0	**Units:**	ug/L
Lab Code:	K2207229-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.14**		0.020	1	10/10/02	10/19/02	KWG0207981	
2-Methylnaphthalene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthene	**0.21**		0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenzofuran	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluorene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Phenanthrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluoranthene	**0.039**		0.020	1	10/10/02	10/19/02	KWG0207981	
Pyrene	**0.043**		0.020	1	10/10/02	10/19/02	KWG0207981	
Benz(a)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Chrysene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(b)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(k)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(a)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	64	43-96	10/19/02	Acceptable
Fluoranthene-d10	73	20-131	10/19/02	Acceptable
Terphenyl-d14	63	13-146	10/19/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207981-4	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
2-Methylnaphthalene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Acenaphthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenzofuran	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluorene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Phenanthrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benz(a)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Chrysene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(b)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(k)fluoranthene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(a)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/10/02	10/19/02	KWG0207981	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	43-96	10/19/02	Acceptable
Fluoranthene-d10	86	20-131	10/19/02	Acceptable
Terphenyl-d14	115	13-146	10/19/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-S-13.0	**Units:**	ug/Kg
Lab Code:	K2207229-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**85**	D	55	10	10/21/02	10/24/02	KWG0208360	
2-Methylnaphthalene	ND	U	55	10	10/21/02	10/24/02	KWG0208360	
Acenaphthylene	**210**	D	55	10	10/21/02	10/24/02	KWG0208360	
Acenaphthene	ND	U	55	10	10/21/02	10/24/02	KWG0208360	
Dibenzofuran	ND	U	55	10	10/21/02	10/24/02	KWG0208360	
Fluorene	ND	U	55	10	10/21/02	10/24/02	KWG0208360	
Phenanthrene	ND	U	55	10	10/21/02	10/24/02	KWG0208360	
Anthracene	**130**	D	55	10	10/21/02	10/24/02	KWG0208360	
Fluoranthene	**1200**	D	55	10	10/21/02	10/24/02	KWG0208360	
Pyrene	**2100**	D	55	10	10/21/02	10/24/02	KWG0208360	
Benz(a)anthracene	**1300**	D	55	10	10/21/02	10/24/02	KWG0208360	
Chrysene	**1500**	D	55	10	10/21/02	10/24/02	KWG0208360	
Benzo(b)fluoranthene	**1800**	D	55	10	10/21/02	10/24/02	KWG0208360	
Benzo(k)fluoranthene	**1500**	D	55	10	10/21/02	10/24/02	KWG0208360	
Benzo(a)pyrene	**3300**	D	55	10	10/21/02	10/24/02	KWG0208360	
Indeno(1,2,3-cd)pyrene	**2300**	D	55	10	10/21/02	10/24/02	KWG0208360	
Dibenz(a,h)anthracene	**230**	D	55	10	10/21/02	10/24/02	KWG0208360	
Benzo(g,h,i)perylene	**2500**	D	55	10	10/21/02	10/24/02	KWG0208360	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	69	43-98	10/24/02	Acceptable
Fluoranthene-d10	87	52-108	10/24/02	Acceptable
Terphenyl-d14	84	61-122	10/24/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-S-21.0	**Units:**	ug/Kg
Lab Code:	K2207229-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**160**	D	54	10	10/21/02	10/24/02	KWG0208360	
2-Methylnaphthalene	ND	U	54	10	10/21/02	10/24/02	KWG0208360	
Acenaphthylene	**590**	D	54	10	10/21/02	10/24/02	KWG0208360	
Acenaphthene	**5600**	D	54	10	10/21/02	10/24/02	KWG0208360	
Dibenzofuran	**300**	D	54	10	10/21/02	10/24/02	KWG0208360	
Fluorene	**3400**	D	54	10	10/21/02	10/24/02	KWG0208360	
Phenanthrene	**24000**	D	540	100	10/21/02	10/24/02	KWG0208360	
Anthracene	**6700**	D	54	10	10/21/02	10/24/02	KWG0208360	
Fluoranthene	**19000**	D	540	100	10/21/02	10/24/02	KWG0208360	
Pyrene	**21000**	D	540	100	10/21/02	10/24/02	KWG0208360	
Benz(a)anthracene	**6800**	D	54	10	10/21/02	10/24/02	KWG0208360	
Chrysene	**6900**	D	54	10	10/21/02	10/24/02	KWG0208360	
Benzo(b)fluoranthene	**4400**	D	54	10	10/21/02	10/24/02	KWG0208360	
Benzo(k)fluoranthene	**3800**	D	54	10	10/21/02	10/24/02	KWG0208360	
Benzo(a)pyrene	**8400**	D	54	10	10/21/02	10/24/02	KWG0208360	
Indeno(1,2,3-cd)pyrene	**4400**	D	54	10	10/21/02	10/24/02	KWG0208360	
Dibenz(a,h)anthracene	**470**	D	54	10	10/21/02	10/24/02	KWG0208360	
Benzo(g,h,i)perylene	**4300**	D	54	10	10/21/02	10/24/02	KWG0208360	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	87	43-98	10/24/02	Acceptable
Fluoranthene-d10	111	52-108	10/24/02	Outside Control Limits
Terphenyl-d14	78	61-122	10/24/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/07/2002
Sample Matrix:	Soil	**Date Received:**	10/09/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-S-26.0	**Units:**	ug/Kg
Lab Code:	K2207229-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
2-Methylnaphthalene	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
Acenaphthylene	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
Acenaphthene	**7.9**		7.1	1	10/21/02	10/24/02	KWG0208360	
Dibenzofuran	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
Fluorene	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
Phenanthrene	**55**		7.1	1	10/21/02	10/24/02	KWG0208360	
Anthracene	**13**		7.1	1	10/21/02	10/24/02	KWG0208360	
Fluoranthene	**48**		7.1	1	10/21/02	10/24/02	KWG0208360	
Pyrene	**68**		7.1	1	10/21/02	10/24/02	KWG0208360	
Benz(a)anthracene	**17**		7.1	1	10/21/02	10/24/02	KWG0208360	
Chrysene	**23**		7.1	1	10/21/02	10/24/02	KWG0208360	
Benzo(b)fluoranthene	**14**		7.1	1	10/21/02	10/24/02	KWG0208360	
Benzo(k)fluoranthene	**12**		7.1	1	10/21/02	10/24/02	KWG0208360	
Benzo(a)pyrene	**20**		7.1	1	10/21/02	10/24/02	KWG0208360	
Indeno(1,2,3-cd)pyrene	**14**		7.1	1	10/21/02	10/24/02	KWG0208360	
Dibenz(a,h)anthracene	ND	U	7.1	1	10/21/02	10/24/02	KWG0208360	
Benzo(g,h,i)perylene	**17**		7.1	1	10/21/02	10/24/02	KWG0208360	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	65	43-98	10/24/02	Acceptable
Fluoranthene-d10	77	52-108	10/24/02	Acceptable
Terphenyl-d14	93	61-122	10/24/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208360-5	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
2-Methylnaphthalene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Acenaphthylene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Acenaphthene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Dibenzofuran	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Fluorene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Phenanthrene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Anthracene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Fluoranthene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Pyrene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Benz(a)anthracene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Chrysene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Benzo(b)fluoranthene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Benzo(k)fluoranthene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Benzo(a)pyrene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Dibenz(a,h)anthracene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	
Benzo(g,h,i)perylene	ND	U	5.0	1	10/21/02	10/24/02	KWG0208360	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	43-98	10/24/02	Acceptable
Fluoranthene-d10	75	52-108	10/24/02	Acceptable
Terphenyl-d14	91	61-122	10/24/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207229

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP5-W-68.0	K2207229-004	43	49	46
GP5-W-95.0	K2207229-005	64	73	63
Method Blank	KWG0207981-4	81	86	115
Batch QC	K2207208-004	79	74	50
Batch QCMS	KWG0207981-1	81	79	60
Batch QCDMS	KWG0207981-2	84	81	58
Lab Control Sample	KWG0207981-3	84	92	91

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-96
Sur2 =	Fluoranthene-d10	20-131
Sur3 =	Terphenyl-d14	13-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207229

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP5-S-13.0	K2207229-001	69 D	87 D	84 D
GP5-S-21.0	K2207229-002	87 D	111 D *	78 D
GP5-S-26.0	K2207229-003	65	77	93
Method Blank	KWG0208360-5	71	75	91
GP5-S-13.0MS	KWG0208360-1	62 D	75 D	76 D
GP5-S-13.0DMS	KWG0208360-2	80 D	99 D	88 D
Lab Control Sample	KWG0208360-3	79	77	82
Duplicate Lab Control Sample	KWG0208360-4	76	76	83

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-98
Sur2 =	Fluoranthene-d10	52-108
Sur3 =	Terphenyl-d14	61-122

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/10/2002
Sample Matrix:	Water	**Date Analyzed:**	10/19/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2207208-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207981

		Batch QCMS KWG0207981-1 Matrix Spike			Batch QCDMS KWG0207981-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	ND	7.85	11.1	71	8.26	11.1	74	30-97	5	30
2-Methylnaphthalene	ND	7.95	11.1	72	8.26	11.1	74	33-96	4	30
Acenaphthylene	ND	9.83	11.1	88	10.1	11.1	91	39-104	2	30
Acenaphthene	ND	8.54	11.1	77	8.85	11.1	80	34-99	3	30
Dibenzofuran	ND	8.63	11.1	78	8.95	11.1	81	16-110	4	30
Fluorene	ND	8.98	11.1	81	9.54	11.1	86	36-105	6	30
Phenanthrene	ND	7.94	11.1	71	8.42	11.1	76	31-106	6	30
Anthracene	ND	7.51	11.1	68	7.73	11.1	70	24-111	3	30
Fluoranthene	ND	7.64	11.1	69	7.88	11.1	71	16-121	3	30
Pyrene	0.020	7.49	11.1	67	7.66	11.1	69	11-125	2	30
Benz(a)anthracene	ND	6.99	11.1	63	7.00	11.1	63	14-125	0	30
Chrysene	ND	6.25	11.1	56	6.31	11.1	57	16-117	1	30
Benzo(b)fluoranthene	ND	6.80	11.1	61	6.61	11.1	59	16-124	3	30
Benzo(k)fluoranthene	ND	6.42	11.1	58	6.15	11.1	55	14-127	4	30
Benzo(a)pyrene	ND	6.80	11.1	61	6.41	11.1	58	19-126	6	30
Indeno(1,2,3-cd)pyrene	ND	6.19	11.1	56	6.23	11.1	56	10-137	1	30
Dibenz(a,h)anthracene	ND	5.61	11.1	50	5.62	11.1	51	16-124	0	30
Benzo(g,h,i)perylene	ND	5.66	11.1	51	5.60	11.1	50	15-119	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/21/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/24/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	GP5-S-13.0	**Units:**	ug/Kg
Lab Code:	K2207229-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0208360

		GP5-S-13.0MS KWG0208360-1 Matrix Spike			GP5-S-13.0DMS KWG0208360-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	85	216	270	48	212	271	47	19-105	2	40
2-Methylnaphthalene	ND	140	270	52	155	271	57	36-95	11	40
Acenaphthylene	210	375	270	60	520	271	113 *	40-99	32	40
Acenaphthene	ND	162	270	60	217	271	80	33-102	29	40
Dibenzofuran	ND	168	270	62	225	271	83	38-100	29	40
Fluorene	ND	176	270	65	242	271	89	38-103	31	40
Phenanthrene	ND	250	270	92	357	271	132 *	33-113	35	40
Anthracene	130	343	270	78	609	271	177 *	40-114	56 *	40
Fluoranthene	1200	1280	270	26 #	3350	271	791 #	41-117	90 *	40
Pyrene	2100	2200	270	32 #	5120	271	1111 #	26-139	80 *	40
Benz(a)anthracene	1300	1540	270	76 #	2730	271	519 #	32-134	56 *	40
Chrysene	1500	1730	270	75 #	3090	271	575 #	27-135	56 *	40
Benzo(b)fluoranthene	1800	2070	270	100 #	3190	271	511 #	31-136	42 *	40
Benzo(k)fluoranthene	1500	1750	270	106 #	2460	271	368 #	32-131	34	40
Benzo(a)pyrene	3300	3730	270	158 #	5580	271	843 #	26-146	40	40
Indeno(1,2,3-cd)pyrene	2300	2540	270	87 #	3570	271	470 #	33-133	34	40
Dibenz(a,h)anthracene	230	379	270	55	544	271	116 *	42-114	36	40
Benzo(g,h,i)perylene	2500	2810	270	104 #	3770	271	459 #	31-122	29	40

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/10/2002
Sample Matrix:	Water	**Date Analyzed:**	10/19/2002

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0207981

	Lab Control Sample KWG0207981-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	3.57	5.00	71	37-95
2-Methylnaphthalene	3.54	5.00	71	26-110
Acenaphthylene	4.23	5.00	85	44-103
Acenaphthene	3.86	5.00	77	41-97
Dibenzofuran	3.94	5.00	79	17-130
Fluorene	4.24	5.00	85	46-102
Phenanthrene	4.19	5.00	84	47-101
Anthracene	4.49	5.00	90	45-104
Fluoranthene	4.79	5.00	96	51-112
Pyrene	4.67	5.00	93	45-111
Benz(a)anthracene	4.63	5.00	93	50-111
Chrysene	4.56	5.00	91	51-108
Benzo(b)fluoranthene	5.41	5.00	108	54-114
Benzo(k)fluoranthene	5.24	5.00	105	51-117
Benzo(a)pyrene	5.60	5.00	112	51-119
Indeno(1,2,3-cd)pyrene	4.31	5.00	86	43-127
Dibenz(a,h)anthracene	4.02	5.00	80	47-119
Benzo(g,h,i)perylene	4.22	5.00	84	44-115

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207229
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/21/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/24/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8270C SIM	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0208360

	Lab Control Sample KWG0208360-3 Lab Control Spike			Duplicate Lab Control Sample KWG0208360-4 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	187	249	75	177	249	71	33-98	5	40
2-Methylnaphthalene	193	249	78	186	249	75	36-103	4	40
Acenaphthylene	215	249	86	206	249	83	41-102	4	40
Acenaphthene	203	249	81	196	249	79	41-97	4	40
Dibenzofuran	204	249	82	196	249	79	38-102	4	40
Fluorene	211	249	85	204	249	82	43-101	4	40
Phenanthrene	211	249	85	208	249	83	45-101	1	40
Anthracene	241	249	97	233	249	94	46-109	3	40
Fluoranthene	223	249	89	218	249	88	49-112	2	40
Pyrene	247	249	99	242	249	97	50-112	2	40
Benz(a)anthracene	229	249	92	226	249	91	52-114	1	40
Chrysene	221	249	89	222	249	89	54-109	0	40
Benzo(b)fluoranthene	247	249	99	250	249	100	54-115	1	40
Benzo(k)fluoranthene	233	249	94	238	249	95	54-115	2	40
Benzo(a)pyrene	271	249	109	269	249	108	54-120	1	40
Indeno(1,2,3-cd)pyrene	216	249	87	205	249	82	49-121	5	40
Dibenz(a,h)anthracene	198	249	79	186	249	75	48-114	6	40
Benzo(g,h,i)perylene	215	249	86	203	249	82	45-113	6	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services INC.
An Employee-Owned Company

November 5, 2002

Service Request No: K2207133

Dana Bayuk
Maul Foster & Alongi, Inc.
7223 N.E. Hazel Dell Avenue
Suite B
Vancouver, WA 98665

RE: Wacker/8128.01.04/3

Dear Dana:

Enclosed are the results of the sample(s) submitted to our laboratory on October 4, 2002. For your reference, these analyses have been assigned our service request number K2207133.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.

Harvey Jacky
Project Chemist

HJ/afs

NELAC Accredited

1317 South 13th Avenue PO Box 479 Kelso Washington 98626
(360) 577-7222 (800) 695-7222x07 Fax (360) 636-1068

ACIL Seal of Excellence Laboratory

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

SCOEPA00011475

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Maul Foster & Alongi, Inc.	**Service Request No.:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Received:**	10/4/02
Sample Matrix:	Soil/Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Matrix/Duplicate Matrix Spike (MS/DMS).

Sample Receipt

Three soil and two water samples were received for analysis at Columbia Analytical Services on 10/4/02. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration Exceptions:
The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL2080: Methylene Chloride. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 9.0%. The calibration meets the alternative evaluation criteria.

The primary evaluation criterion was exceeded for the following analytes in Initial Calibration (ICAL) ID CAL2058: Bromomethane. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 8.1%. The calibration meets the alternative evaluation criteria.

Surrogate Exceptions:
The control criteria were exceeded for the following surrogate(s) in GP7-S-15.5: Dibromofluoromethane, Toluene-d8 and 4-Bromofluorobenzene. Since the problem may indicate a potential bias in the analytical batch, all associated field samples were reanalyzed. The surrogates met control criteria for the reanalysis. Note the results for the field samples were comparable for both determinations, which indicates the problem with the initial analysis was restricted to the surrogate recovery. Therefore, the results from the original analysis are reported. The data is flagged to indicate the problem.

Laboratory Control Sample (LCS) Exceptions:
The advisory criterion was exceeded for the following analytes in LCS KWG0208042-3: Tetrachloroethene, Chlorobenzene, 1,1,2,2-Tetrachloroethane and 1,2,3-Trichlorobenzene. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

Approved by_____ **Date** 11/4/02

The advisory criterion was exceeded for the following analytes in LCS KWG0208138-1 and KWG0208138-2: Chloromethane, Methyl tert-Butyl Ether and cis-1,2-Dichloroethene. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The advisory criterion was exceeded for 1,3-Dichloropropene in LCS KWG0208159-3. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The advisory criterion was exceeded for the following analytes in LCS KWG0208191-3: 1,1,2-Trichloroethane and 1,3-Dichloropropane. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

Elevated Method Reporting Limits:
Samples GP7-W-78.0 and GP7-W-98.0 required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C SIM

Initial Calibration (ICAL) Exceptions:
The primary evaluation criterion was exceeded for the following analytes in ICAL ID CAL2040: 2,6-Dimethylnaphthalene, Acenaphthylene, 2,4,6-Tribromophenol, Pentachlorophenol, Anthracene, Carbazole, Fluoranthene, Benz(a)anthracene, Benzo(a)pyrene. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 12.6%. The calibration meets the alternative evaluation criteria.

Method Blank Exceptions:
The Method Blank KWG0207819-4 contained low levels of Naphthalene above the Method Reporting Limit (MRL). In accordance with CAS QA/QC policy, all sample results less than twenty times the level found in the Method Blank are flagged as estimated. The samples were not re-extracted and reanalyzed because insufficient sample remained for additional testing.

Surrogate Exceptions:
The control criteria for the Fluoranthene-d10 surrogate in sample GP7-S-15.5 are not applicable. The analysis of the sample required a dilution, which resulted in a surrogate concentration below the Method Reporting Limit (MRL). No further corrective action was appropriate.

The control criteria were exceeded for the following surrogate in sample GP7-S-30.0 due to matrix interferences: Fluoranthene-d10. Due to the presence of non-target background components that prevented adequate resolution of the surrogate, accurate quantitation was not possible. No further corrective action was appropriate.

Relative Percent Difference (RPD) Exceptions:
The RPD for the following analytes in the replicate matrix spike analyses of Batch QC was outside control criteria: Naphthalene, 2-Methylnaphthalene. In general, the RPD was relatively high for all spiked compounds, which indicates a low bias in the Matrix Spike (MS). All spike recoveries in the MS, DMS, and associated Laboratory Control Sample (LCS) were within acceptance limits, indicating the analytical batch was in control. No further corrective action was appropriate.

Approved by _____ **Date** 11/4/02

Chain of Custody Documentation

SCOEPA00011478

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

SR#: 112204123

PAGE 1 OF 1 COC # 00008

*PROJECT NAME: Wacker
PROJECT NUMBER: 8128.01.04/3
PROJECT MANAGER: Dana Bayuk, MFA Inc.
COMPANY/ADDRESS: 7223 NE Hazel Dell Ave., Suite B, Vancouver, WA 98665
PHONE #: 360-694-2691 FAX #: 360-906-1958
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☒ 8270LL☐ SIM☐	Volatile Organics 624☐ 8260☒	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ 8021☐ BTEX☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	Metals, Total or Dissolved (See list below)	Cyanide☒	Hex-Chrom☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐						REMARKS
GP7-S-9.0	10/2/02	13:13	1	SOIL	2	X	X																			
GP7-S-15.5	10/2/02	13:23	2	SOIL	2	X	X																			IMPACTED?
GP7-S-30.0	10/2/02	14:07	3	SOIL	2	X	X																			
GP7-W-78.0	10/3/02	13:30	4	WATER	5	X	X									X										
GP7-W-98.0	10/4/02	10:30	5	WATER	5	X	X									X										
trip3			6	WATER	2																					HOLD

REPORT REQUIREMENTS

___ I. Routine Report: Method Blank, Surrogate, as required
X II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. #
Bill To:

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date/Time: 10/4/02 11:00	Signature: [signature] Date/Time: 10/4/02 1535	Signature: Date/Time:	Signature: Date/Time:
Printed Name: ANTHONY BHARWADA Firm: MFA, Inc	Printed Name: [signature] Firm: CAS	Printed Name: Firm:	Printed Name: Firm:

RCOC #1 04/02

SCOEPA00011479

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client MF. Work Order K22 04133

Cooler received on 10/4/02 and opened on 10/4/02 by Cm

1. Were custody seals on outside of cooler? Y N
   If yes, how many and where? 1F + 1 Side
2. Were seals intact and signature & date correct? Y N
3. COC #
   Temperature of cooler(s) upon receipt: 1.0
   Temperature Blank: 5.2
4. Were custody papers properly filled out (ink, signed, etc.)? Y N
5. Type of packing material present 16 packs
6. Did all bottles arrive in good condition (unbroken)? Y N
7. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? Y N
8. Did all bottle labels and tags agree with custody papers? Y N
9. Were the correct types of bottles used for the tests indicated? Y N
10. Were all of the preserved bottles received at the lab with the appropriate pH? Y N
11. Were VOA vials checked for absence of air bubbles, and if present, noted below? Y N
12. Did the bottles originate from CAS/K or a branch laboratory? Y N
13. Are CWA Microbiology samples received with > ½ the 24 hr. hold time remaining from collection? Y N
14. Was CL2/Residual negative? Y N

Explain any discrepancies: _____

RESOLUTION: _____

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

CRFREV.DOC12/24/01

SCOEPA00011480

Total Solids

SCOEPA00011481

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207133

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: WET

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
GP7-S-9.0	K2207133-001	10/02/2002	10/04/2002	10/07/2002	90.8	
GP7-S-15.5	K2207133-002	10/02/2002	10/04/2002	10/07/2002	92.0	
GP7-S-30.0	K2207133-003	10/02/2002	10/04/2002	10/07/2002	68.2	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002
		Date Analyzed:	10/07/2002

Duplicate Sample Summary

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	WET
Test Notes:			

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
GP7-S-9.0	K2207133-001	90.8	91.7	91.3	<1	

General Chemistry Parameters

SCOEPA00011484

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133
Date Collected: 10/3/02
Date Received: 10/4/02

Cyanide, Total

Prep Method: NONE
Analysis Method: 335.2
Test Notes:

Units: mg/L (ppm)
Basis: NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
GP7-W-78.0	K2207133-004	0.10	10	NA	10/12/02	0.63	
GP7-W-98.0	K2207133-005	0.10	10	NA	10/12/02	0.64	
Method Blank	K2207133-MB	0.01	1	NA	10/12/02	ND	

Approved By: _____ Date: 11/4/02

1A/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133
Date Collected: 10/3/2002
Date Received: 10/4/2002
Date Extracted: NA
Date Analyzed: 10/12/2002

Duplicate Summary
Inorganic Parameters

Sample Name: GP7-W-78.0
Lab Code: K2207133-004DUP
Test Notes:

Units: mg/L (ppm)
Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Cyanide, Total	NONE	335.2	0.10	0.63	0.62	0.62	2	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/23/02

DUP/020597p

07133WET.DMI - DUP 10/23/2002

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/3/2002
Sample Matrix:	Water	**Date Received:**	10/4/2002
		Date Extracted:	NA
		Date Analyzed:	10/12/2002

Matrix Spike Summary
Inorganic Parameters

Sample Name:	GP7-W-78.0	Units:	mg/L (ppm)
Lab Code:	K2207133-004MS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.10	0.10	0.63	0.71	84	75-125	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: Paul Sl Date: 10/23/02

MS/020597p

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	10/12/2002

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name:	Lab Control Sample	Units:	mg/L (ppm)
Lab Code:	K2207133-LCS	Basis:	NA
Test Notes:			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Cyanide, Total	NONE	335.2	0.86	0.95	111	85-115	

Percent recoveries and Relative Percent Differences (RPD) are determined using values which have not been rounded.

Approved By: _____ Date: 10/23/02

LCS/020597p

Volatile Organic Compounds
Method 8260

SCOEPA00011489

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/03/2002
Sample Matrix:	Water	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-W-78.0	Units:	ug/L
Lab Code:	K2207133-004	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Chloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	*
Vinyl Chloride	**440**	D	13	25	10/12/02	10/12/02	KWG0208138	
Bromomethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Chloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Trichlorofluoromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Acetone	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethene	**23**	D	13	25	10/12/02	10/12/02	KWG0208138	
Methyl tert-Butyl Ether	ND	U	13	25	10/12/02	10/12/02	KWG0208138	*
Carbon Disulfide	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Methylene Chloride	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
trans-1,2-Dichloroethene	**15**	D	13	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
2-Butanone (MEK)	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
2,2-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
cis-1,2-Dichloroethene	**6900**	D	130	250	10/11/02	10/11/02	KWG0208042	
Chloroform	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromochloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,1-Trichloroethane (TCA)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Carbon Tetrachloride	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichloroethane (EDC)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Benzene	**35**	D	13	25	10/12/02	10/12/02	KWG0208138	
Trichloroethene (TCE)	**1000**	D	5.0	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromodichloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Dibromomethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
2-Hexanone	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
cis-1,3-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Toluene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
trans-1,3-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,2-Trichloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
4-Methyl-2-pentanone (MIBK)	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
1,3-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/03/2002
Sample Matrix:	Water	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-W-78.0	Units:	ug/L
Lab Code:	K2207133-004	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Dibromochloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dibromoethane (EDB)	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Chlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,1,2-Tetrachloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Ethylbenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
m,p-Xylenes	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
o-Xylene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Styrene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromoform	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Isopropylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,1,2,2-Tetrachloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
n-Propylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
2-Chlorotoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
4-Chlorotoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,3,5-Trimethylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
tert-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,4-Trimethylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
sec-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,3-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
4-Isopropyltoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,4-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
n-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dibromo-3-chloropropane	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,4-Trichlorobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichlorobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Naphthalene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Hexachlorobutadiene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Collected:	10/03/2002
ample Matrix:	Water	Date Received:	10/04/2002

Volatile Organic Compounds

ample Name:	GP7-W-78.0	Units:	ug/L
ab Code:	K2207133-004	Basis:	NA

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
ibromofluoromethane	99	78-124	10/12/02	Acceptable
oluene-d8	105	87-118	10/12/02	Acceptable
-Bromofluorobenzene	102	81-113	10/12/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/04/2002
Sample Matrix:	Water	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-W-98.0	**Units:**	ug/L
Lab Code:	K2207133-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Chloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	*
Vinyl Chloride	**6300**	D	250	500	10/11/02	10/11/02	KWG0208042	
Bromomethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Chloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Trichlorofluoromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Acetone	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethene	**36**	D	13	25	10/12/02	10/12/02	KWG0208138	
Methyl tert-Butyl Ether	ND	U	13	25	10/12/02	10/12/02	KWG0208138	*
Carbon Disulfide	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Methylene Chloride	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
trans-1,2-Dichloroethene	**23**	D	13	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
2-Butanone (MEK)	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
2,2-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
cis-1,2-Dichloroethene	**23000**	D	250	500	10/11/02	10/11/02	KWG0208042	
Chloroform	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromochloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,1-Trichloroethane (TCA)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Carbon Tetrachloride	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichloroethane (EDC)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Benzene	**38**	D	13	25	10/12/02	10/12/02	KWG0208138	
Trichloroethene (TCE)	**250**	D	5.0	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromodichloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Dibromomethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
2-Hexanone	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
cis-1,3-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Toluene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
trans-1,3-Dichloropropene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,2-Trichloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
4-Methyl-2-pentanone (MIBK)	ND	U	500	25	10/12/02	10/12/02	KWG0208138	
1,3-Dichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/04/2002
Sample Matrix:	Water	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-W-98.0	Units:	ug/L
Lab Code:	K2207133-005	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Dibromochloromethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dibromoethane (EDB)	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Chlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,1,1,2-Tetrachloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Ethylbenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
m,p-Xylenes	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
o-Xylene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Styrene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromoform	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Isopropylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,1,2,2-Tetrachloroethane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichloropropane	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
Bromobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
n-Propylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
2-Chlorotoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
4-Chlorotoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,3,5-Trimethylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
tert-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,4-Trimethylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
sec-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,3-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
4-Isopropyltoluene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,4-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
n-Butylbenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2-Dichlorobenzene	ND	U	13	25	10/12/02	10/12/02	KWG0208138	
1,2-Dibromo-3-chloropropane	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,4-Trichlorobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichlorobenzene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Naphthalene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	
Hexachlorobutadiene	ND	U	50	25	10/12/02	10/12/02	KWG0208138	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/04/2002
Sample Matrix:	Water	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-W-98.0	**Units:**	ug/L
Lab Code:	K2207133-005	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	78-124	10/12/02	Acceptable
Toluene-d8	105	87-118	10/12/02	Acceptable
4-Bromofluorobenzene	102	81-113	10/12/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/L
ab Code:	KWG0208042-4	Basis:	NA
xtraction Method:	EPA 5030B	Level:	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
)ichlorodifluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
:hloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
/inyl Chloride	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
3romomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
:hloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Trichlorofluoromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Acetone	ND	U	20	1	10/11/02	10/11/02	KWG0208042	
1,1-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Carbon Disulfide	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Methylene Chloride	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,1-Dichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
2-Butanone (MEK)	ND	U	20	1	10/11/02	10/11/02	KWG0208042	
2,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Chloroform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Bromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,1-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Carbon Tetrachloride	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Benzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Trichloroethene (TCE)	ND	U	0.20	1	10/11/02	10/11/02	KWG0208042	
1,2-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Bromodichloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Dibromomethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
2-Hexanone	ND	U	20	1	10/11/02	10/11/02	KWG0208042	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Toluene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,1,2-Trichloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/11/02	10/11/02	KWG0208042	
1,3-Dichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208042-4	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	*
Dibromochloromethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
Chlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	*
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	*
Ethylbenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
m,p-Xylenes	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
o-Xylene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Styrene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Bromoform	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Isopropylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,2,3-Trichloropropane	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
Bromobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
n-Propylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
2-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
4-Chlorotoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
tert-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
sec-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,3-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
4-Isopropyltoluene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,4-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
n-Butylbenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,2-Dichlorobenzene	ND	U	0.50	1	10/11/02	10/11/02	KWG0208042	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	*
Naphthalene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	
Hexachlorobutadiene	ND	U	2.0	1	10/11/02	10/11/02	KWG0208042	

* See Case Narrative

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208042-4	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	94	78-124	10/11/02	Acceptable
Toluene-d8	94	87-118	10/11/02	Acceptable
4-Bromofluorobenzene	87	81-113	10/11/02	Acceptable

Comments:

00027

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208138-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Chloromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	*
Vinyl Chloride	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Bromomethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Chloroethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Trichlorofluoromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Acetone	ND	U	20	1	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Methyl tert-Butyl Ether	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	*
Carbon Disulfide	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Methylene Chloride	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
trans-1,2-Dichloroethene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,1-Dichloroethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
2-Butanone (MEK)	ND	U	20	1	10/12/02	10/12/02	KWG0208138	
2,2-Dichloropropane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
cis-1,2-Dichloroethene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	*
Chloroform	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Bromochloromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,1-Dichloropropene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Carbon Tetrachloride	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Benzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Trichloroethene (TCE)	ND	U	0.20	1	10/12/02	10/12/02	KWG0208138	
1,2-Dichloropropane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Bromodichloromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Dibromomethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
2-Hexanone	ND	U	20	1	10/12/02	10/12/02	KWG0208138	
cis-1,3-Dichloropropene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Toluene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
trans-1,3-Dichloropropene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,1,2-Trichloroethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/12/02	10/12/02	KWG0208138	
1,3-Dichloropropane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Water	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/L
Lab Code:	KWG0208138-3	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Dibromochloromethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
Chlorobenzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Ethylbenzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
m,p-Xylenes	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
o-Xylene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Styrene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Bromoform	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Isopropylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichloropropane	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
Bromobenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
n-Propylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
2-Chlorotoluene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
4-Chlorotoluene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,3,5-Trimethylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
tert-Butylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,2,4-Trimethylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
sec-Butylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,3-Dichlorobenzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
4-Isopropyltoluene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,4-Dichlorobenzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
n-Butylbenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,2-Dichlorobenzene	ND	U	0.50	1	10/12/02	10/12/02	KWG0208138	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,2,4-Trichlorobenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
1,2,3-Trichlorobenzene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
Naphthalene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	
Hexachlorobutadiene	ND	U	2.0	1	10/12/02	10/12/02	KWG0208138	

* See Case Narrative

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0208138-3	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	78-124	10/12/02	Acceptable
Toluene-d8	106	87-118	10/12/02	Acceptable
4-Bromofluorobenzene	103	81-113	10/12/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/02/2002
Sample Matrix:	Soil	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-9.0	Units:	ug/Kg
Lab Code:	K2207133-001	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Chloromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Vinyl Chloride	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Bromomethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Chloroethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Trichlorofluoromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Acetone	ND	U	55	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloroethene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Methyl tert-Butyl Ether	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Carbon Disulfide	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Methylene Chloride	ND	U	11	1	10/11/02	10/11/02	KWG0208059	
trans-1,2-Dichloroethene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloroethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
2-Butanone (MEK)	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
2,2-Dichloropropane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
cis-1,2-Dichloroethene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Chloroform	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Bromochloromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,1,1-Trichloroethane (TCA)	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloropropene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Carbon Tetrachloride	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichloroethane (EDC)	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Benzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Trichloroethene (TCE)	ND	U	2.2	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichloropropane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Bromodichloromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Dibromomethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
2-Hexanone	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
cis-1,3-Dichloropropene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Toluene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
trans-1,3-Dichloropropene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,1,2-Trichloroethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
4-Methyl-2-pentanone (MIBK)	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,3-Dichloropropane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	

Comments:

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207133
Date Collected: 10/02/2002
Date Received: 10/04/2002

Volatile Organic Compounds

Sample Name: GP7-S-9.0
Lab Code: K2207133-001

Units: ug/Kg
Basis: Dry

Extraction Method: EPA 5030A
Analysis Method: 8260B

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Dibromochloromethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,2-Dibromoethane (EDB)	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
Chlorobenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,1,1,2-Tetrachloroethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Ethylbenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
m,p-Xylenes	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
o-Xylene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Styrene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Bromoform	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Isopropylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,1,2,2-Tetrachloroethane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,2,3-Trichloropropane	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
Bromobenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
n-Propylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
2-Chlorotoluene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
4-Chlorotoluene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,3,5-Trimethylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
tert-Butylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,2,4-Trimethylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
sec-Butylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,3-Dichlorobenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
4-Isopropyltoluene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,4-Dichlorobenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
n-Butylbenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichlorobenzene	ND	U	5.5	1	10/11/02	10/11/02	KWG0208059	
1,2-Dibromo-3-chloropropane	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,2,4-Trichlorobenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
1,2,3-Trichlorobenzene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
Naphthalene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	
Hexachlorobutadiene	ND	U	22	1	10/11/02	10/11/02	KWG0208059	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-9.0	**Units:**	ug/Kg
Lab Code:	K2207133-001	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	87	84-121	10/11/02	Acceptable
Toluene-d8	85	80-125	10/11/02	Acceptable
4-Bromofluorobenzene	83	80-123	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-15.5	**Units:**	ug/Kg
Lab Code:	K2207133-002	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Chloromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Vinyl Chloride	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Bromomethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Chloroethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Trichlorofluoromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Acetone	ND	U	54	1	10/14/02	10/14/02	KWG0208159	
1,1-Dichloroethene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Methyl tert-Butyl Ether	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Carbon Disulfide	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Methylene Chloride	ND	U	11	1	10/14/02	10/14/02	KWG0208159	
trans-1,2-Dichloroethene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,1-Dichloroethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
2-Butanone (MEK)	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
2,2-Dichloropropane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
cis-1,2-Dichloroethene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Chloroform	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Bromochloromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,1,1-Trichloroethane (TCA)	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,1-Dichloropropene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Carbon Tetrachloride	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,2-Dichloroethane (EDC)	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Benzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Trichloroethene (TCE)	ND	U	2.2	1	10/14/02	10/14/02	KWG0208159	
1,2-Dichloropropane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Bromodichloromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Dibromomethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
2-Hexanone	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
cis-1,3-Dichloropropene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Toluene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
trans-1,3-Dichloropropene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,1,2-Trichloroethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
4-Methyl-2-pentanone (MIBK)	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,3-Dichloropropane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	*

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/02/2002
Sample Matrix:	Soil	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-15.5	Units:	ug/Kg
Lab Code:	K2207133-002	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Dibromochloromethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,2-Dibromoethane (EDB)	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
Chlorobenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,1,1,2-Tetrachloroethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Ethylbenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
m,p-Xylenes	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
o-Xylene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Styrene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Bromoform	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Isopropylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,1,2,2-Tetrachloroethane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,2,3-Trichloropropane	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
Bromobenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
n-Propylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
2-Chlorotoluene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
4-Chlorotoluene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,3,5-Trimethylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
tert-Butylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,2,4-Trimethylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
sec-Butylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,3-Dichlorobenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
4-Isopropyltoluene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,4-Dichlorobenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
n-Butylbenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,2-Dichlorobenzene	ND	U	5.4	1	10/14/02	10/14/02	KWG0208159	
1,2-Dibromo-3-chloropropane	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,2,4-Trichlorobenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
1,2,3-Trichlorobenzene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
Naphthalene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	
Hexachlorobutadiene	ND	U	22	1	10/14/02	10/14/02	KWG0208159	

* See Case Narrative

Comments:

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-15.5	**Units:**	ug/Kg
Lab Code:	K2207133-002	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	82	84-121	10/14/02	Outside Control Limits
Toluene-d8	78	80-125	10/14/02	Outside Control Limits
4-Bromofluorobenzene	78	80-123	10/14/02	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Collected:	10/02/2002
ample Matrix:	Soil	Date Received:	10/04/2002

Volatile Organic Compounds

ample Name:	GP7-S-30.0	Units:	ug/Kg
ab Code:	K2207133-003	Basis:	Dry
xtraction Method:	EPA 5030A	Level:	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ichlorodifluoromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
hloromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
inyl Chloride	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
romomethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
hloroethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
richlorofluoromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
cetone	ND	U	270	1	10/15/02	10/15/02	KWG0208191	
,1-Dichloroethene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
ethyl tert-Butyl Ether	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
arbon Disulfide	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
ethylene Chloride	ND	U	54	1	10/15/02	10/15/02	KWG0208191	
rans-1,2-Dichloroethene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
,1-Dichloroethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
-Butanone (MEK)	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
,2-Dichloropropane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
is-1,2-Dichloroethene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
hloroform	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
romochloromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
,1,1-Trichloroethane (TCA)	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
,1-Dichloropropene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
arbon Tetrachloride	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
,2-Dichloroethane (EDC)	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
enzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
richloroethene (TCE)	ND	U	11	1	10/15/02	10/15/02	KWG0208191	
,2-Dichloropropane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
romodichloromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
ibromomethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
-Hexanone	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
is-1,3-Dichloropropene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
oluene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
rans-1,3-Dichloropropene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
,1,2-Trichloroethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	*
-Methyl-2-pentanone (MIBK)	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
,3-Dichloropropane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	*

Comments:

00037

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-30.0	**Units:**	ug/Kg
Lab Code:	K2207133-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Dibromochloromethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
1,2-Dibromoethane (EDB)	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
Chlorobenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
1,1,1,2-Tetrachloroethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Ethylbenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
m,p-Xylenes	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
o-Xylene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Styrene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Bromoform	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Isopropylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,1,2,2-Tetrachloroethane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
1,2,3-Trichloropropane	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
Bromobenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
n-Propylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
2-Chlorotoluene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
4-Chlorotoluene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,3,5-Trimethylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
tert-Butylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,2,4-Trimethylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
sec-Butylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,3-Dichlorobenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
4-Isopropyltoluene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,4-Dichlorobenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
n-Butylbenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,2-Dichlorobenzene	ND	U	27	1	10/15/02	10/15/02	KWG0208191	
1,2-Dibromo-3-chloropropane	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,2,4-Trichlorobenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
1,2,3-Trichlorobenzene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	
Naphthalene	**180**		110	1	10/15/02	10/15/02	KWG0208191	
Hexachlorobutadiene	ND	U	110	1	10/15/02	10/15/02	KWG0208191	

* See Case Narrative

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	10/02/2002
Sample Matrix:	Soil	Date Received:	10/04/2002

Volatile Organic Compounds

Sample Name:	GP7-S-30.0	Units:	ug/Kg
Lab Code:	K2207133-003	Basis:	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	84	84-121	10/15/02	Acceptable
Toluene-d8	82	80-125	10/15/02	Acceptable
4-Bromofluorobenzene	84	80-123	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208059-3	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Chloromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Vinyl Chloride	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Bromomethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Chloroethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Trichlorofluoromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Acetone	ND	U	50	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloroethene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Methyl tert-Butyl Ether	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Carbon Disulfide	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Methylene Chloride	ND	U	10	1	10/11/02	10/11/02	KWG0208059	
trans-1,2-Dichloroethene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloroethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
2-Butanone (MEK)	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
2,2-Dichloropropane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
cis-1,2-Dichloroethene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Chloroform	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Bromochloromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,1-Dichloropropene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Carbon Tetrachloride	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichloroethane (EDC)	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Benzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Trichloroethene (TCE)	ND	U	2.0	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichloropropane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Bromodichloromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Dibromomethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
2-Hexanone	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
cis-1,3-Dichloropropene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Toluene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
trans-1,3-Dichloropropene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,1,2-Trichloroethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,3-Dichloropropane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Collected:	NA
Sample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG0208059-3	Basis:	Dry
Extraction Method:	EPA 5030A	Level:	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Dibromochloromethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,2-Dibromoethane (EDB)	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
Chlorobenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Ethylbenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
m,p-Xylenes	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
o-Xylene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Styrene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Bromoform	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Isopropylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,2,3-Trichloropropane	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
Bromobenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
n-Propylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
2-Chlorotoluene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
4-Chlorotoluene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,3,5-Trimethylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
tert-Butylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,2,4-Trimethylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
sec-Butylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,3-Dichlorobenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
4-Isopropyltoluene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,4-Dichlorobenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
n-Butylbenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,2-Dichlorobenzene	ND	U	5.0	1	10/11/02	10/11/02	KWG0208059	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,2,4-Trichlorobenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
1,2,3-Trichlorobenzene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
Naphthalene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	
Hexachlorobutadiene	ND	U	20	1	10/11/02	10/11/02	KWG0208059	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208059-3	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	78	84-121	10/11/02	Outside Control Limits
Toluene-d8	85	80-125	10/11/02	Acceptable
4-Bromofluorobenzene	85	80-123	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

:lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/Kg
.ab Code:	KWG0208159-5	Basis:	Dry
:xtraction Method:	EPA 5030A	Level:	Low
.nalysis Method:	8260B		

.nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
)ichlorodifluoromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:hloromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
'inyl Chloride	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
;romomethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:hloroethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
'richlorofluoromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
\cetone	ND	U	50	1	10/14/02	10/14/02	KWG0208159	
.1-Dichloroethene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
/lethyl tert-Butyl Ether	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:arbon Disulfide	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
/lethylene Chloride	ND	U	10	1	10/14/02	10/14/02	KWG0208159	
:ans-1,2-Dichloroethene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
.1-Dichloroethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
-Butanone (MEK)	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
.2-Dichloropropane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
is-1,2-Dichloroethene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:hloroform	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
3romochloromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
.1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
.1-Dichloropropene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:arbon Tetrachloride	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
.2-Dichloroethane (EDC)	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
3enzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
'richloroethene (TCE)	ND	U	2.0	1	10/14/02	10/14/02	KWG0208159	
.2-Dichloropropane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
3romodichloromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
)ibromomethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:-Hexanone	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
:is-1,3-Dichloropropene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
'oluene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
:rans-1,3-Dichloropropene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
1.1,2-Trichloroethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1.3-Dichloropropane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	*

'omments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208159-5	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetrachloroethene (PCE)	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Dibromochloromethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
1,2-Dibromoethane (EDB)	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
Chlorobenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
1,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Ethylbenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
m,p-Xylenes	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
o-Xylene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Styrene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Bromoform	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Isopropylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
1,2,3-Trichloropropane	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
Bromobenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
n-Propylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
2-Chlorotoluene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
4-Chlorotoluene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,3,5-Trimethylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
tert-Butylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,2,4-Trimethylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
sec-Butylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,3-Dichlorobenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
4-Isopropyltoluene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,4-Dichlorobenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
n-Butylbenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,2-Dichlorobenzene	ND	U	5.0	1	10/14/02	10/14/02	KWG0208159	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,2,4-Trichlorobenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
1,2,3-Trichlorobenzene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
Naphthalene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	
Hexachlorobutadiene	ND	U	20	1	10/14/02	10/14/02	KWG0208159	

* See Case Narrative

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
roject:	Wacker/8128.01.04/3	**Date Collected:**	NA
ample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

ample Name:	Method Blank	**Units:**	ug/Kg
ab Code:	KWG0208159-5	**Basis:**	Dry

urrogate Name	%Rec	Control Limits	Date Analyzed	Note
)ibromofluoromethane	89	84-121	10/14/02	Acceptable
'oluene-d8	89	80-125	10/14/02	Acceptable
-Bromofluorobenzene	88	80-123	10/14/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208191-5	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Chloromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Vinyl Chloride	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Bromomethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Chloroethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Trichlorofluoromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Acetone	ND	U	50	1	10/15/02	10/15/02	KWG0208191	
1,1-Dichloroethene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Methyl tert-Butyl Ether	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Carbon Disulfide	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Methylene Chloride	ND	U	10	1	10/15/02	10/15/02	KWG0208191	
trans-1,2-Dichloroethene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,1-Dichloroethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
2-Butanone (MEK)	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
2,2-Dichloropropane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
cis-1,2-Dichloroethene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Chloroform	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Bromochloromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,1,1-Trichloroethane (TCA)	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,1-Dichloropropene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Carbon Tetrachloride	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,2-Dichloroethane (EDC)	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Benzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Trichloroethene (TCE)	ND	U	2.0	1	10/15/02	10/15/02	KWG0208191	
1,2-Dichloropropane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Bromodichloromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Dibromomethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
2-Hexanone	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
cis-1,3-Dichloropropene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Toluene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
trans-1,3-Dichloropropene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,1,2-Trichloroethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	*
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,3-Dichloropropane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	*

Comments:

00046

SCOEPA00011517

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Collected:	NA
ample Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

ample Name:	Method Blank	Units:	ug/Kg
ab Code:	KWG0208191-5	Basis:	Dry
xtraction Method:	EPA 5030A	Level:	Low
nalysis Method:	8260B		

nalyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
etrachloroethene (PCE)	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
ibromochloromethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
,2-Dibromoethane (EDB)	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
hlorobenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
,1,1,2-Tetrachloroethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
thylbenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
n,p-Xylenes	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
o-Xylene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
tyrene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
romoform	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
sopropylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,1,2,2-Tetrachloroethane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,2,3-Trichloropropane	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
Bromobenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
n-Propylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
2-Chlorotoluene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
4-Chlorotoluene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,3,5-Trimethylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
tert-Butylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,2,4-Trimethylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
sec-Butylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,3-Dichlorobenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
4-Isopropyltoluene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,4-Dichlorobenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
n-Butylbenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,2-Dichlorobenzene	ND	U	5.0	1	10/15/02	10/15/02	KWG0208191	
1,2-Dibromo-3-chloropropane	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,2,4-Trichlorobenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
1,2,3-Trichlorobenzene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
Naphthalene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	
Hexachlorobutadiene	ND	U	20	1	10/15/02	10/15/02	KWG0208191	

* See Case Narrative

Comments:

00047

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0208191-5	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	85	84-121	10/15/02	Acceptable
Toluene-d8	90	80-125	10/15/02	Acceptable
4-Bromofluorobenzene	85	80-123	10/15/02	Acceptable

Comments:

00048

SCOEPA00011519

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP7-W-78.0	K2207133-004	99	105	102
GP7-W-98.0	K2207133-005	99	105	102
Method Blank	KWG0208042-4	94	94	87
Method Blank	KWG0208138-3	99	106	103
GP7-W-78.0MS	KWG0208042-1	94	96	95
GP7-W-78.0DMS	KWG0208042-2	95	95	95
Lab Control Sample	KWG0208042-3	95	96	94
Lab Control Sample	KWG0208138-1	97	105	102
Duplicate Lab Control Sample	KWG0208138-2	98	106	101

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	78-124
Sur2 =	Toluene-d8	87-118
Sur3 =	4-Bromofluorobenzene	81-113

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00049

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207133

Surrogate Recovery Summary
Volatile Organic Compounds

Extraction Method: EPA 5030A
Analysis Method: 8260B

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1		Sur2		Sur3	
GP7-S-9.0	K2207133-001	87		85		83	
GP7-S-15.5	K2207133-002	82	*	78	*	78	*
GP7-S-30.0	K2207133-003	84		82		84	
Method Blank	KWG0208059-3	78	*	85		85	
Method Blank	KWG0208159-5	89		89		88	
Method Blank	KWG0208191-5	85		90		85	
GP7-S-9.0MS	KWG0208059-4	91		82		82	
GP7-S-9.0DMS	KWG0208059-5	87		81		86	
Lab Control Sample	KWG0208059-1	84		82		83	
Lab Control Sample	KWG0208159-3	88		83		91	
Lab Control Sample	KWG0208191-3	85		80		84	

Surrogate Recovery Control Limits (%)

Sur1 =	Dibromofluoromethane	84-121
Sur2 =	Toluene-d8	80-125
Sur3 =	4-Bromofluorobenzene	80-123

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00050

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Extracted:	10/11/2002
Sample Matrix:	Water	Date Analyzed:	10/11/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	GP7-W-78.0	Units:	ug/L
Lab Code:	K2207133-004	Basis:	NA
Extraction Method:	EPA 5030B	Level:	Low
Analysis Method:	8260B	Extraction Lot:	KWG0208042

Analyte Name	Sample Result	GP7-W-78.0MS KWG0208042-1 Matrix Spike			GP7-W-78.0DMS KWG0208042-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
1,1-Dichloroethene	23	2660	2500	106	2480	2500	98	67-157	7	30
Benzene	35	2700	2500	106	2540	2500	100	76-138	6	30
Trichloroethene (TCE)	1000	3640	2500	106	3370	2500	95	66-149	8	30
Toluene	ND	2660	2500	106	2480	2500	99	82-131	7	30
Chlorobenzene	ND	2980	2500	119	2780	2500	111	70-131	7	30
1,2-Dichlorobenzene	ND	2810	2500	112	2640	2500	106	70-126	6	30
Naphthalene	ND	2730	2500	109	2650	2500	106	50-149	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00051

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/11/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/12/2002

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

Sample Name:	GP7-S-9.0	**Units:**	ug/Kg
Lab Code:	K2207133-001	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B	**Extraction Lot:**	KWG0208059

		GP7-S-9.0MS KWG0208059-4 Matrix Spike			GP7-S-9.0DMS KWG0208059-5 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,1-Dichloroethene	ND	41.2	54.1	76	38.2	54.2	70	54-141	8	40
Benzene	ND	43.3	54.1	80	39.0	54.2	72	56-124	10	40
Trichloroethene (TCE)	ND	41.6	54.1	77	40.5	54.2	75	43-173	3	40
Toluene	ND	43.5	54.1	80	40.3	54.2	74	34-141	8	40
Chlorobenzene	ND	38.8	54.1	72	36.2	54.2	67	31-136	7	40
1,2-Dichlorobenzene	ND	32.2	54.1	60	30.5	54.2	56	19-138	5	40
Naphthalene	ND	29.5	54.1	55	28.0	54.2	52	10-143	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00052

SCOEPA00011523

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Extracted:	10/11/2002
Sample Matrix:	Water	Date Analyzed:	10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	Units:	ug/L
Analysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208042

Analyte Name	Lab Control Sample KWG0208042-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
Dichlorodifluoromethane	13.1	10.0	131	33-189
Chloromethane	9.47	10.0	95	66-128
Vinyl Chloride	11.4	10.0	114	76-135
Bromomethane	10.8	10.0	108	30-188
Chloroethane	10.0	10.0	100	79-131
Trichlorofluoromethane	10.1	10.0	101	73-127
Acetone	45.0	50.0	90	60-157
1,1-Dichloroethene	10.6	10.0	106	79-137
Methyl tert-Butyl Ether	8.32	10.0	83	78-128
Carbon Disulfide	20.0	20.0	100	68-118
Methylene Chloride	10.2	10.0	102	68-135
trans-1,2-Dichloroethene	10.4	10.0	104	88-127
1,1-Dichloroethane	10.4	10.0	104	89-133
2-Butanone (MEK)	52.2	50.0	104	78-144
2,2-Dichloropropane	8.84	10.0	88	71-138
cis-1,2-Dichloroethene	10.2	10.0	102	90-126
Chloroform	10.0	10.0	100	88-117
Bromochloromethane	11.4	10.0	114	80-133
1,1,1-Trichloroethane (TCA)	9.82	10.0	98	83-122
1,1-Dichloropropene	10.0	10.0	100	87-137
Carbon Tetrachloride	10.4	10.0	104	87-131
1,2-Dichloroethane (EDC)	9.50	10.0	95	73-130
Benzene	10.5	10.0	105	90-120
Trichloroethene (TCE)	11.0	10.0	110	83-131
1,2-Dichloropropane	10.0	10.0	100	87-121
Bromodichloromethane	9.25	10.0	93	84-114
Dibromomethane	10.0	10.0	100	76-130
2-Hexanone	51.6	50.0	103	68-135
cis-1,3-Dichloropropene	10.1	10.0	101	90-126
Toluene	10.4	10.0	104	89-119
trans-1,3-Dichloropropene	9.42	10.0	94	77-113
1,1,2-Trichloroethane	11.0	10.0	110	81-116
4-Methyl-2-pentanone (MIBK)	54.5	50.0	109	79-138
1,3-Dichloropropane	11.0	10.0	110	76-129
Tetrachloroethene (PCE)	12.6	10.0	126 *	82-123
Dibromochloromethane	11.4	10.0	114	83-119

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00053

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133
Date Extracted: 10/11/2002
Date Analyzed: 10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0208042

Analyte Name	Lab Control Sample KWG0208042-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
1,2-Dibromoethane (EDB)	11.3	10.0	113	74-130
Chlorobenzene	11.7	10.0	117 *	86-115
1,1,1,2-Tetrachloroethane	12.2	10.0	122 *	88-118
Ethylbenzene	11.8	10.0	118	89-124
m,p-Xylenes	23.2	20.0	116	90-122
o-Xylene	11.6	10.0	116	88-126
Styrene	11.6	10.0	116	91-123
Bromoform	11.1	10.0	111	76-125
Isopropylbenzene	10.5	10.0	105	82-123
1,1,2,2-Tetrachloroethane	9.76	10.0	98	78-117
1,2,3-Trichloropropane	10.6	10.0	106	75-127
Bromobenzene	11.6	10.0	116	76-129
n-Propylbenzene	10.5	10.0	105	83-128
2-Chlorotoluene	10.3	10.0	103	74-131
4-Chlorotoluene	10.3	10.0	103	87-119
1,3,5-Trimethylbenzene	10.8	10.0	108	85-128
tert-Butylbenzene	11.1	10.0	111	83-129
1,2,4-Trimethylbenzene	11.0	10.0	110	88-129
sec-Butylbenzene	11.0	10.0	110	84-133
1,3-Dichlorobenzene	10.9	10.0	109	87-116
4-Isopropyltoluene	10.5	10.0	105	81-126
1,4-Dichlorobenzene	10.8	10.0	108	86-115
n-Butylbenzene	9.61	10.0	96	79-134
1,2-Dichlorobenzene	11.0	10.0	110	85-113
1,2-Dibromo-3-chloropropane	9.86	10.0	99	55-136
1,2,4-Trichlorobenzene	11.5	10.0	115	76-130
1,2,3-Trichlorobenzene	13.9	10.0	139 *	70-134
Naphthalene	11.5	10.0	115	71-137
Hexachlorobutadiene	12.0	10.0	120	77-129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00054

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Extracted:	10/12/2002
Sample Matrix:	Water	Date Analyzed:	10/12/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030B	Units:	ug/L
Analysis Method:	8260B	Basis:	NA
		Level:	Low
		Extraction Lot:	KWG0208138

	Lab Control Sample KWG0208138-1 Lab Control Spike			Duplicate Lab Control Sample KWG0208138-2 Duplicate Lab Control Spike					
Analyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Dichlorodifluoromethane	6.72	10.0	67	6.06	10.0	61	33-189	10	30
Chloromethane	6.25	10.0	63 *	5.88	10.0	59 *	66-128	6	30
Vinyl Chloride	8.83	10.0	88	8.43	10.0	84	76-135	5	30
Bromomethane	6.03	10.0	60	5.94	10.0	59	30-188	2	30
Chloroethane	8.64	10.0	86	8.46	10.0	85	79-131	2	30
Trichlorofluoromethane	9.17	10.0	92	8.77	10.0	88	73-127	4	30
Acetone	46.1	50.0	92	44.3	50.0	89	60-157	4	30
1,1-Dichloroethene	9.53	10.0	95	9.28	10.0	93	79-137	3	30
Methyl tert-Butyl Ether	6.58	10.0	66 *	6.55	10.0	66 *	78-128	0	30
Carbon Disulfide	18.6	20.0	93	17.9	20.0	90	68-118	4	30
Methylene Chloride	9.14	10.0	91	9.02	10.0	90	68-135	1	30
trans-1,2-Dichloroethene	9.42	10.0	94	9.29	10.0	93	88-127	1	30
1,1-Dichloroethane	10.6	10.0	106	10.3	10.0	103	89-133	3	30
2-Butanone (MEK)	44.7	50.0	89	43.5	50.0	87	78-144	3	30
2,2-Dichloropropane	9.71	10.0	97	9.36	10.0	94	71-138	4	30
cis-1,2-Dichloroethene	9.23	10.0	92	8.93	10.0	89 *	90-126	3	30
Chloroform	9.97	10.0	100	9.79	10.0	98	88-117	2	30
Bromochloromethane	10.7	10.0	107	10.3	10.0	103	80-133	3	30
1,1,1-Trichloroethane (TCA)	10.7	10.0	107	10.3	10.0	103	83-122	4	30
1,1-Dichloropropene	10.5	10.0	105	10.2	10.0	102	87-137	3	30
Carbon Tetrachloride	11.0	10.0	110	11.0	10.0	110	87-131	0	30
1,2-Dichloroethane (EDC)	9.88	10.0	99	9.45	10.0	95	73-130	4	30
Benzene	10.2	10.0	102	9.86	10.0	99	90-120	3	30
Trichloroethene (TCE)	10.8	10.0	108	10.8	10.0	108	83-131	0	30
1,2-Dichloropropane	9.72	10.0	97	9.48	10.0	95	87-121	3	30
Bromodichloromethane	9.35	10.0	94	9.18	10.0	92	84-114	2	30
Dibromomethane	9.78	10.0	98	9.53	10.0	95	76-130	3	30
2-Hexanone	45.2	50.0	90	42.8	50.0	86	68-135	5	30
cis-1,3-Dichloropropene	10.2	10.0	102	9.97	10.0	100	90-126	2	30
Toluene	10.2	10.0	102	10.0	10.0	100	89-119	2	30
trans-1,3-Dichloropropene	9.39	10.0	94	9.09	10.0	91	77-113	3	30
1,1,2-Trichloroethane	9.75	10.0	98	9.48	10.0	95	81-116	3	30
4-Methyl-2-pentanone (MIBK)	43.6	50.0	87	41.7	50.0	83	79-138	5	30
1,3-Dichloropropane	9.59	10.0	96	9.40	10.0	94	76-129	2	30
Tetrachloroethene (PCE)	10.9	10.0	109	10.6	10.0	106	82-123	3	30
Dibromochloromethane	9.55	10.0	96	9.35	10.0	94	83-119	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00055

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133
Date Extracted: 10/12/2002
Date Analyzed: 10/12/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method: EPA 5030B
Analysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0208138

	Lab Control Sample KWG0208138-1 Lab Control Spike			Duplicate Lab Control Sample KWG0208138-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
1,2-Dibromoethane (EDB)	9.95	10.0	100	9.66	10.0	97	74-130	3	30
Chlorobenzene	10.2	10.0	102	9.93	10.0	99	86-115	2	30
1,1,1,2-Tetrachloroethane	10.2	10.0	102	9.90	10.0	99	88-118	3	30
Ethylbenzene	10.9	10.0	109	10.5	10.0	105	89-124	4	30
m,p-Xylenes	21.3	20.0	107	20.4	20.0	102	90-122	4	30
o-Xylene	10.6	10.0	106	10.3	10.0	103	88-126	3	30
Styrene	10.6	10.0	106	10.4	10.0	104	91-123	2	30
Bromoform	9.76	10.0	98	9.72	10.0	97	76-125	0	30
Isopropylbenzene	10.0	10.0	100	9.78	10.0	98	82-123	2	30
1,1,2,2-Tetrachloroethane	8.95	10.0	90	8.50	10.0	85	78-117	5	30
1,2,3-Trichloropropane	10.1	10.0	101	9.99	10.0	100	75-127	1	30
Bromobenzene	10.3	10.0	103	10.0	10.0	100	76-129	3	30
n-Propylbenzene	10.8	10.0	108	10.5	10.0	105	83-128	3	30
2-Chlorotoluene	10.3	10.0	103	9.93	10.0	99	74-131	3	30
4-Chlorotoluene	10.1	10.0	101	9.85	10.0	99	87-119	3	30
1,3,5-Trimethylbenzene	10.5	10.0	105	10.2	10.0	102	85-128	3	30
tert-Butylbenzene	10.8	10.0	108	10.3	10.0	103	83-129	5	30
1,2,4-Trimethylbenzene	10.8	10.0	108	10.5	10.0	105	88-129	3	30
sec-Butylbenzene	11.1	10.0	111	10.7	10.0	107	84-133	3	30
1,3-Dichlorobenzene	9.95	10.0	100	9.87	10.0	99	87-116	1	30
4-Isopropyltoluene	10.5	10.0	105	10.0	10.0	100	81-126	4	30
1,4-Dichlorobenzene	10.0	10.0	100	9.79	10.0	98	86-115	2	30
n-Butylbenzene	10.4	10.0	104	10.1	10.0	101	79-134	2	30
1,2-Dichlorobenzene	9.73	10.0	97	9.70	10.0	97	85-113	0	30
1,2-Dibromo-3-chloropropane	10.0	10.0	100	9.91	10.0	99	55-136	1	30
1,2,4-Trichlorobenzene	9.90	10.0	99	9.76	10.0	98	76-130	1	30
1,2,3-Trichlorobenzene	9.52	10.0	95	9.47	10.0	95	70-134	1	30
Naphthalene	9.25	10.0	93	9.65	10.0	97	71-137	4	30
Hexachlorobutadiene	11.2	10.0	112	10.9	10.0	109	77-129	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Extracted:	10/11/2002
ample Matrix:	Soil	Date Analyzed:	10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

:xtraction Method:	EPA 5030A	Units:	ug/Kg
,nalysis Method:	8260B	Basis:	Dry
		Level:	Low
		Extraction Lot:	KWG0208059

	Lab Control Sample KWG0208059-1 Lab Control Spike			
,nalyte Name	Result	Expected	%Rec	%Rec Limits
)ichlorodifluoromethane	47.9	50.0	96	46-130
:hloromethane	45.4	50.0	91	55-118
/inyl Chloride	52.6	50.0	105	64-137
3romomethane	49.3	50.0	99	58-147
:hloroethane	51.2	50.0	102	60-137
:richlorofluoromethane	49.4	50.0	99	58-125
\cetone	197	250	79	59-111
..1-Dichloroethene	51.7	50.0	103	76-135
\ethyl tert-Butyl Ether	48.6	50.0	97	71-143
:arbon Disulfide	96.1	100	96	70-101
\ethylene Chloride	52.8	50.0	106	76-117
rans-1,2-Dichloroethene	52.1	50.0	104	77-132
1,1-Dichloroethane	52.3	50.0	105	84-122
2-Butanone (MEK)	253	250	101	76-133
2,2-Dichloropropane	55.2	50.0	110	74-134
:is-1,2-Dichloroethene	52.8	50.0	106	79-123
:hloroform	51.4	50.0	103	74-122
3romochloromethane	52.6	50.0	105	77-131
1,1,1-Trichloroethane (TCA)	52.2	50.0	104	66-137
1,1-Dichloropropene	55.5	50.0	111	81-130
Carbon Tetrachloride	56.4	50.0	113	70-142
1,2-Dichloroethane (EDC)	50.5	50.0	101	67-132
Benzene	49.2	50.0	98	84-115
Trichloroethene (TCE)	55.1	50.0	110	78-128
1,2-Dichloropropane	55.0	50.0	110	84-114
Bromodichloromethane	53.3	50.0	107	72-120
Dibromomethane	53.7	50.0	107	75-124
2-Hexanone	227	250	91	75-125
cis-1,3-Dichloropropene	54.8	50.0	110	88-122
Toluene	52.6	50.0	105	80-119
trans-1,3-Dichloropropene	47.8	50.0	96	73-116
1,1,2-Trichloroethane	49.1	50.0	98	76-115
4-Methyl-2-pentanone (MIBK)	231	250	92	78-122
1,3-Dichloropropane	52.6	50.0	105	74-111
Tetrachloroethene (PCE)	53.7	50.0	107	71-129
Dibromochloromethane	49.5	50.0	99	79-121

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00057

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/11/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/11/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030A	**Units:**	ug/Kg
Analysis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0208059

	Lab Control Sample KWG0208059-1 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	50.0	50.0	100	80-121
Chlorobenzene	54.2	50.0	108	77-117
1,1,1,2-Tetrachloroethane	52.0	50.0	104	77-126
Ethylbenzene	53.7	50.0	107	78-125
m,p-Xylenes	99.5	100	100	74-122
o-Xylene	52.8	50.0	106	76-123
Styrene	54.8	50.0	110	78-127
Bromoform	46.9	50.0	94	75-139
Isopropylbenzene	53.3	50.0	107	71-123
1,1,2,2-Tetrachloroethane	46.9	50.0	94	72-120
1,2,3-Trichloropropane	47.4	50.0	95	73-133
Bromobenzene	50.2	50.0	100	69-132
n-Propylbenzene	51.5	50.0	103	70-123
2-Chlorotoluene	50.8	50.0	102	69-123
4-Chlorotoluene	51.3	50.0	103	70-123
1,3,5-Trimethylbenzene	55.0	50.0	110	70-127
tert-Butylbenzene	53.6	50.0	107	69-127
1,2,4-Trimethylbenzene	55.1	50.0	110	73-138
sec-Butylbenzene	53.1	50.0	106	70-129
1,3-Dichlorobenzene	54.0	50.0	108	72-122
4-Isopropyltoluene	54.9	50.0	110	71-119
1,4-Dichlorobenzene	52.0	50.0	104	74-119
n-Butylbenzene	60.0	50.0	120	69-120
1,2-Dichlorobenzene	52.8	50.0	106	72-121
1,2-Dibromo-3-chloropropane	50.6	50.0	101	71-125
1,2,4-Trichlorobenzene	52.7	50.0	105	68-130
1,2,3-Trichlorobenzene	53.5	50.0	107	70-127
Naphthalene	49.4	50.0	99	74-127
Hexachlorobutadiene	56.0	50.0	112	60-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00058

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
roject:	Wacker/8128.01.04/3	Date Extracted:	10/14/2002
ımple Matrix:	Soil	Date Analyzed:	10/14/2002

Lab Control Spike Summary
Volatile Organic Compounds

xtraction Method:	EPA 5030A	Units:	ug/Kg
nalysis Method:	8260B	Basis:	Dry
		Level:	Low
		Extraction Lot:	KWG0208159

	Lab Control Sample KWG0208159-3 Lab Control Spike			
.nalyte Name	Result	Expected	%Rec	%Rec Limits
)ichlorodifluoromethane	46.4	50.0	93	46-130
:hloromethane	40.4	50.0	81	55-118
'inyl Chloride	48.2	50.0	96	64-137
;romomethane	53.8	50.0	108	58-147
:hloroethane	47.7	50.0	95	60-137
'richlorofluoromethane	46.8	50.0	94	58-125
\cetone	263	250	105	59-111
,1-Dichloroethene	49.8	50.0	100	76-135
Methyl tert-Butyl Ether	54.2	50.0	108	71-143
:arbon Disulfide	94.0	100	94	70-101
Methylene Chloride	50.3	50.0	101	76-117
rans-1,2-Dichloroethene	51.3	50.0	103	77-132
,1-Dichloroethane	55.0	50.0	110	84-122
2-Butanone (MEK)	332	250	133	76-133
2,2-Dichloropropane	50.6	50.0	101	74-134
:is-1,2-Dichloroethene	51.2	50.0	102	79-123
Chloroform	53.5	50.0	107	74-122
Bromochloromethane	56.4	50.0	113	77-131
,1,1-Trichloroethane (TCA)	49.1	50.0	98	66-137
1,1-Dichloropropene	54.1	50.0	108	81-130
Carbon Tetrachloride	52.0	50.0	104	70-142
1,2-Dichloroethane (EDC)	55.5	50.0	111	67-132
Benzene	52.1	50.0	104	84-115
Trichloroethene (TCE)	51.2	50.0	102	78-128
1,2-Dichloropropane	51.0	50.0	102	84-114
Bromodichloromethane	50.2	50.0	100	72-120
Dibromomethane	54.1	50.0	108	75-124
2-Hexanone	302	250	121	75-125
cis-1,3-Dichloropropene	53.9	50.0	108	88-122
Toluene	53.9	50.0	108	80-119
trans-1,3-Dichloropropene	52.2	50.0	104	73-116
1,1,2-Trichloroethane	54.8	50.0	110	76-115
4-Methyl-2-pentanone (MIBK)	299	250	120	78-122
1,3-Dichloropropane	56.1	50.0	112 *	74-111
Tetrachloroethene (PCE)	52.6	50.0	105	71-129
Dibromochloromethane	55.4	50.0	111	79-121

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00059

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/14/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/14/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030A	**Units:**	ug/Kg
Analysis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0208159

	Lab Control Sample KWG0208159-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	54.3	50.0	109	80-121
Chlorobenzene	53.9	50.0	108	77-117
1,1,1,2-Tetrachloroethane	54.8	50.0	110	77-126
Ethylbenzene	55.0	50.0	110	78-125
m,p-Xylenes	117	100	117	74-122
o-Xylene	54.4	50.0	109	76-123
Styrene	54.6	50.0	109	78-127
Bromoform	54.2	50.0	108	75-139
Isopropylbenzene	55.6	50.0	111	71-123
1,1,2,2-Tetrachloroethane	48.3	50.0	97	72-120
1,2,3-Trichloropropane	48.4	50.0	97	73-133
Bromobenzene	46.9	50.0	94	69-132
n-Propylbenzene	47.9	50.0	96	70-123
2-Chlorotoluene	47.6	50.0	95	69-123
4-Chlorotoluene	44.9	50.0	90	70-123
1,3,5-Trimethylbenzene	48.4	50.0	97	70-127
tert-Butylbenzene	50.0	50.0	100	69-127
1,2,4-Trimethylbenzene	53.5	50.0	107	73-138
sec-Butylbenzene	49.1	50.0	98	70-129
1,3-Dichlorobenzene	49.8	50.0	100	72-122
4-Isopropyltoluene	52.4	50.0	105	71-119
1,4-Dichlorobenzene	49.8	50.0	100	74-119
n-Butylbenzene	52.8	50.0	106	69-120
1,2-Dichlorobenzene	49.4	50.0	99	72-121
1,2-Dibromo-3-chloropropane	55.7	50.0	111	71-125
1,2,4-Trichlorobenzene	53.1	50.0	106	68-130
1,2,3-Trichlorobenzene	53.2	50.0	106	70-127
Naphthalene	52.1	50.0	104	74-127
Hexachlorobutadiene	51.2	50.0	102	60-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00060

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	Service Request:	K2207133
Project:	Wacker/8128.01.04/3	Date Extracted:	10/15/2002
Sample Matrix:	Soil	Date Analyzed:	10/15/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030A	Units:	ug/Kg
Analysis Method:	8260B	Basis:	Dry
		Level:	Low
		Extraction Lot:	KWG0208191

	Lab Control Sample KWG0208191-3 Lab Control Spike			
Analyte Name	Result	Expected	%Rec	%Rec Limits
Dichlorodifluoromethane	45.8	50.0	92	46-130
Chloromethane	37.2	50.0	74	55-118
Vinyl Chloride	52.1	50.0	104	64-137
Bromomethane	50.9	50.0	102	58-147
Chloroethane	51.5	50.0	103	60-137
Trichlorofluoromethane	46.0	50.0	92	58-125
Acetone	203	250	81	59-111
1,1-Dichloroethene	48.6	50.0	97	76-135
Methyl tert-Butyl Ether	55.4	50.0	111	71-143
Carbon Disulfide	99.0	100	99	70-101
Methylene Chloride	56.6	50.0	113	76-117
trans-1,2-Dichloroethene	51.5	50.0	103	77-132
1,1-Dichloroethane	54.4	50.0	109	84-122
2-Butanone (MEK)	244	250	98	76-133
1,2-Dichloropropane	52.3	50.0	105	74-134
cis-1,2-Dichloroethene	51.9	50.0	104	79-123
Chloroform	51.8	50.0	104	74-122
Bromochloromethane	53.8	50.0	108	77-131
1,1,1-Trichloroethane (TCA)	52.0	50.0	104	66-137
1,1-Dichloropropene	53.5	50.0	107	81-130
Carbon Tetrachloride	52.1	50.0	104	70-142
1,2-Dichloroethane (EDC)	53.2	50.0	106	67-132
Benzene	55.9	50.0	112	84-115
Trichloroethene (TCE)	53.5	50.0	107	78-128
1,2-Dichloropropane	55.3	50.0	111	84-114
Bromodichloromethane	53.2	50.0	106	72-120
Dibromomethane	52.8	50.0	106	75-124
2-Hexanone	244	250	98	75-125
cis-1,3-Dichloropropene	52.7	50.0	105	88-122
Toluene	50.3	50.0	101	80-119
trans-1,3-Dichloropropene	55.1	50.0	110	73-116
1,1,2-Trichloroethane	60.2	50.0	120 *	76-115
4-Methyl-2-pentanone (MIBK)	248	250	99	78-122
1,3-Dichloropropane	60.3	50.0	121 *	74-111
Tetrachloroethene (PCE)	53.7	50.0	107	71-129
Dibromochloromethane	56.9	50.0	114	79-121

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/15/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/15/2002

Lab Control Spike Summary
Volatile Organic Compounds

Extraction Method:	EPA 5030A	**Units:**	ug/Kg
Analysis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0208191

	Lab Control Sample KWG0208191-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
1,2-Dibromoethane (EDB)	57.3	50.0	115	80-121
Chlorobenzene	53.5	50.0	107	77-117
1,1,1,2-Tetrachloroethane	59.0	50.0	118	77-126
Ethylbenzene	51.9	50.0	104	78-125
m,p-Xylenes	104	100	104	74-122
o-Xylene	48.8	50.0	98	76-123
Styrene	51.8	50.0	104	78-127
Bromoform	52.8	50.0	106	75-139
Isopropylbenzene	49.0	50.0	98	71-123
1,1,2,2-Tetrachloroethane	55.6	50.0	111	72-120
1,2,3-Trichloropropane	58.3	50.0	117	73-133
Bromobenzene	55.2	50.0	110	69-132
n-Propylbenzene	53.9	50.0	108	70-123
2-Chlorotoluene	53.2	50.0	106	69-123
4-Chlorotoluene	52.8	50.0	106	70-123
1,3,5-Trimethylbenzene	53.9	50.0	108	70-127
tert-Butylbenzene	55.3	50.0	111	69-127
1,2,4-Trimethylbenzene	57.9	50.0	116	73-138
sec-Butylbenzene	55.4	50.0	111	70-129
1,3-Dichlorobenzene	55.1	50.0	110	72-122
4-Isopropyltoluene	52.8	50.0	106	71-119
1,4-Dichlorobenzene	53.3	50.0	107	74-119
n-Butylbenzene	55.5	50.0	111	69-120
1,2-Dichlorobenzene	55.7	50.0	111	72-121
1,2-Dibromo-3-chloropropane	51.8	50.0	104	71-125
1,2,4-Trichlorobenzene	57.2	50.0	114	68-130
1,2,3-Trichlorobenzene	58.3	50.0	117	70-127
Naphthalene	53.3	50.0	107	74-127
Hexachlorobutadiene	55.8	50.0	112	60-145

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Polynuclear Aromatic Hydrocarbons
Method 8270

SCOEPA00011534

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/03/2002
Sample Matrix:	Water	**Date Received:**	10/04/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP7-W-78.0	**Units:**	ug/L
Lab Code:	K2207133-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.036**	B	0.020	1	10/07/02	10/15/02	KWG0207819	
2-Methylnaphthalene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenzofuran	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluorene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Phenanthrene	**0.030**		0.020	1	10/07/02	10/15/02	KWG0207819	
Anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluoranthene	**0.050**		0.020	1	10/07/02	10/15/02	KWG0207819	
Pyrene	**0.056**		0.020	1	10/07/02	10/15/02	KWG0207819	
Benz(a)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Chrysene	**0.023**		0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(b)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(k)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(a)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	54	43-96	10/15/02	Acceptable
Fluoranthene-d10	84	20-131	10/15/02	Acceptable
Terphenyl-d14	88	13-146	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/04/2002
Sample Matrix:	Water	**Date Received:**	10/04/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP7-W-98.0	**Units:**	ug/L
Lab Code:	K2207133-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
2-Methylnaphthalene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenzofuran	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluorene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Phenanthrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benz(a)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Chrysene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(b)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(k)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(a)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	59	43-96	10/15/02	Acceptable
Fluoranthene-d10	89	20-131	10/15/02	Acceptable
Terphenyl-d14	89	13-146	10/15/02	Acceptable

Comments:

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG0207819-4	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.048**		0.020	1	10/07/02	10/15/02	KWG0207819	
2-Methylnaphthalene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Acenaphthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenzofuran	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluorene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Phenanthrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benz(a)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Chrysene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(b)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(k)fluoranthene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(a)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Dibenz(a,h)anthracene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	
Benzo(g,h,i)perylene	ND	U	0.020	1	10/07/02	10/15/02	KWG0207819	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	43-96	10/15/02	Acceptable
Fluoranthene-d10	83	20-131	10/15/02	Acceptable
Terphenyl-d14	93	13-146	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP7-S-9.0	**Units:**	ug/Kg
Lab Code:	K2207133-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**380**		5.6	1	10/09/02	10/15/02	KWG0207967	
2-Methylnaphthalene	**120**		5.6	1	10/09/02	10/15/02	KWG0207967	
Acenaphthylene	**490**		5.6	1	10/09/02	10/15/02	KWG0207967	
Acenaphthene	**18**		5.6	1	10/09/02	10/15/02	KWG0207967	
Dibenzofuran	**14**		5.6	1	10/09/02	10/15/02	KWG0207967	
Fluorene	**32**		5.6	1	10/09/02	10/15/02	KWG0207967	
Phenanthrene	**370**		5.6	1	10/09/02	10/15/02	KWG0207967	
Anthracene	**380**		5.6	1	10/09/02	10/15/02	KWG0207967	
Fluoranthene	**2500**	D	120	20	10/09/02	10/13/02	KWG0207967	
Pyrene	**1800**	D	120	20	10/09/02	10/13/02	KWG0207967	
Benz(a)anthracene	**1400**	D	120	20	10/09/02	10/13/02	KWG0207967	
Chrysene	**1700**	D	120	20	10/09/02	10/13/02	KWG0207967	
Benzo(b)fluoranthene	**1300**	D	120	20	10/09/02	10/13/02	KWG0207967	
Benzo(k)fluoranthene	**1200**	D	120	20	10/09/02	10/13/02	KWG0207967	
Benzo(a)pyrene	**2100**	D	120	20	10/09/02	10/13/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	**2100**	D	120	20	10/09/02	10/13/02	KWG0207967	
Dibenz(a,h)anthracene	**270**		5.6	1	10/09/02	10/15/02	KWG0207967	
Benzo(g,h,i)perylene	**2500**	D	120	20	10/09/02	10/13/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	43-98	10/15/02	Acceptable
Fluoranthene-d10	107	52-108	10/15/02	Acceptable
Terphenyl-d14	92	61-122	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP7-S-15.5	**Units:**	ug/Kg
Lab Code:	K2207133-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**5500**	D	140	5	10/09/02	10/15/02	KWG0207967	
2-Methylnaphthalene	**2200**	D	140	5	10/09/02	10/15/02	KWG0207967	
Acenaphthylene	**6700**	D	140	5	10/09/02	10/15/02	KWG0207967	
Acenaphthene	**730**	D	140	5	10/09/02	10/15/02	KWG0207967	
Dibenzofuran	**240**	D	140	5	10/09/02	10/15/02	KWG0207967	
Fluorene	**930**	D	140	5	10/09/02	10/15/02	KWG0207967	
Phenanthrene	**9200**	D	140	5	10/09/02	10/15/02	KWG0207967	
Anthracene	**5800**	D	140	5	10/09/02	10/15/02	KWG0207967	
Fluoranthene	**32000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Pyrene	**55000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Benz(a)anthracene	**21000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Chrysene	**25000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Benzo(b)fluoranthene	**31000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Benzo(k)fluoranthene	**27000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Benzo(a)pyrene	**57000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	**34000**	D	550	20	10/09/02	10/13/02	KWG0207967	
Dibenz(a,h)anthracene	**4400**	D	140	5	10/09/02	10/15/02	KWG0207967	
Benzo(g,h,i)perylene	**35000**	D	550	20	10/09/02	10/13/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	43-98	10/15/02	Acceptable
Fluoranthene-d10	155	52-108	10/13/02	Outside Control Limits
Terphenyl-d14	110	61-122	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	10/02/2002
Sample Matrix:	Soil	**Date Received:**	10/04/2002

Polynuclear Aromatic Hydrocarbons

Sample Name:	GP7-S-30.0	**Units:**	ug/Kg
Lab Code:	K2207133-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	1100	D	92	5	10/09/02	10/15/02	KWG0207967	
2-Methylnaphthalene	5000	D	92	5	10/09/02	10/15/02	KWG0207967	
Acenaphthylene	1900	D	92	5	10/09/02	10/15/02	KWG0207967	
Acenaphthene	15000	D	92	5	10/09/02	10/15/02	KWG0207967	
Dibenzofuran	970	D	92	5	10/09/02	10/15/02	KWG0207967	
Fluorene	7400	D	92	5	10/09/02	10/15/02	KWG0207967	
Phenanthrene	45000	D	370	20	10/09/02	10/13/02	KWG0207967	
Anthracene	14000	D	92	5	10/09/02	10/15/02	KWG0207967	
Fluoranthene	47000	D	370	20	10/09/02	10/13/02	KWG0207967	
Pyrene	57000	D	370	20	10/09/02	10/13/02	KWG0207967	
Benz(a)anthracene	17000	D	370	20	10/09/02	10/13/02	KWG0207967	
Chrysene	20000	D	370	20	10/09/02	10/13/02	KWG0207967	
Benzo(b)fluoranthene	17000	D	92	5	10/09/02	10/15/02	KWG0207967	
Benzo(k)fluoranthene	14000	D	92	5	10/09/02	10/15/02	KWG0207967	
Benzo(a)pyrene	28000	D	370	20	10/09/02	10/13/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	17000	D	92	5	10/09/02	10/15/02	KWG0207967	
Dibenz(a,h)anthracene	2000	D	92	5	10/09/02	10/15/02	KWG0207967	
Benzo(g,h,i)perylene	16000	D	92	5	10/09/02	10/15/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	88	43-98	10/15/02	Acceptable
Fluoranthene-d10	154	52-108	10/15/02	Outside Control Limits
Terphenyl-d14	95	61-122	10/15/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG0207967-6	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
2-Methylnaphthalene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Acenaphthylene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Acenaphthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Dibenzofuran	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Fluorene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Phenanthrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benz(a)anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Chrysene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(b)fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(k)fluoranthene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(a)pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Dibenz(a,h)anthracene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	
Benzo(g,h,i)perylene	ND	U	5.0	1	10/09/02	10/11/02	KWG0207967	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	43-98	10/11/02	Acceptable
Fluoranthene-d10	82	52-108	10/11/02	Acceptable
Terphenyl-d14	102	61-122	10/11/02	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Water

Service Request: K2207133

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3520C
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP7-W-78.0	K2207133-004	54	84	88
GP7-W-98.0	K2207133-005	59	89	89
Method Blank	KWG0207819-4	72	83	93
Batch QC	K2207144-004	73	85	96
Batch QCMS	KWG0207819-1	71	77	75
Batch QCDMS	KWG0207819-2	79	90	86
Lab Control Sample	KWG0207819-3	75	85	88

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-96
Sur2 =	Fluoranthene-d10	20-131
Sur3 =	Terphenyl-d14	13-146

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Maul Foster & Alongi, Inc.
Project: Wacker/8128.01.04/3
Sample Matrix: Soil

Service Request: K2207133

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: PERCENT
Level: Low

Sample Name	Lab Code	Sur1	Sur2	Sur3
GP7-S-9.0	K2207133-001	88	107	92
GP7-S-15.5	K2207133-002	88 D	155 D #	110 D
GP7-S-30.0	K2207133-003	88 D	154 D *	95 D
Method Blank	KWG0207967-6	72	82	102
Batch QC	K2206967-003	76	91	109
Batch QCMS	KWG0207967-1	71	84	90
Batch QCDMS	KWG0207967-2	70	86	95
Lab Control Sample	KWG0207967-5	68	79	89
Duplicate Lab Control Sample	KWG0207967-8	71	82	94

Surrogate Recovery Control Limits (%)

Sur1 =	Fluorene-d10	43-98
Sur2 =	Fluoranthene-d10	52-108
Sur3 =	Terphenyl-d14	61-122

Results flagged with an asterisk (*) indicate values outside control criteria.
Results flagged with a pound (#) indicate the control criteria is not applicable.

00072

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/07/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/L
Lab Code:	K2207144-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207819

		Batch QCMS KWG0207819-1 Matrix Spike			Batch QCDMS KWG0207819-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	ND	2.40	4.76	50	3.30	4.76	69	30-97	32 *	30
2-Methylnaphthalene	ND	2.08	4.76	44	3.23	4.76	68	33-96	44 *	30
Acenaphthylene	ND	3.13	4.76	66	4.15	4.76	87	39-104	28	30
Acenaphthene	ND	2.71	4.76	57	3.61	4.76	76	34-99	29	30
Dibenzofuran	ND	2.90	4.76	61	3.71	4.76	78	16-110	24	30
Fluorene	ND	3.23	4.76	68	4.00	4.76	84	36-105	21	30
Phenanthrene	ND	3.27	4.76	69	3.86	4.76	81	31-106	16	30
Anthracene	ND	3.36	4.76	71	4.17	4.76	87	24-111	21	30
Fluoranthene	ND	3.62	4.76	76	4.40	4.76	92	16-121	20	30
Pyrene	ND	3.56	4.76	75	4.17	4.76	87	11-125	16	30
Benz(a)anthracene	ND	3.51	4.76	74	4.44	4.76	93	14-125	23	30
Chrysene	ND	3.21	4.76	68	3.98	4.76	83	16-117	21	30
Benzo(b)fluoranthene	ND	3.52	4.76	74	4.24	4.76	89	16-124	19	30
Benzo(k)fluoranthene	ND	3.32	4.76	70	3.92	4.76	82	14-127	17	30
Benzo(a)pyrene	ND	3.79	4.76	80	4.87	4.76	102	19-126	25	30
Indeno(1,2,3-cd)pyrene	ND	3.38	4.76	71	4.56	4.76	96	10-137	30	30
Dibenz(a,h)anthracene	ND	3.13	4.76	66	4.21	4.76	88	16-124	29	30
Benzo(g,h,i)perylene	ND	3.12	4.76	65	4.10	4.76	86	15-119	27	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00073

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/09/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/11/2002

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/Kg
Lab Code:	K2206967-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM	**Extraction Lot:**	KWG0207967

Analyte Name	Sample Result	Batch QCMS KWG0207967-1 Matrix Spike			Batch QCDMS KWG0207967-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Naphthalene	ND	182	263	69	174	263	66	19-105	4	40
2-Methylnaphthalene	ND	188	263	72	180	263	68	36-95	5	40
Acenaphthylene	ND	211	263	80	199	263	76	40-99	5	40
Acenaphthene	ND	198	263	75	191	263	73	33-102	4	40
Dibenzofuran	ND	201	263	76	192	263	73	38-100	5	40
Fluorene	ND	210	263	80	200	263	76	38-103	5	40
Phenanthrene	ND	219	263	83	217	263	83	33-113	1	40
Anthracene	ND	247	263	94	242	263	92	40-114	2	40
Fluoranthene	7.3	254	263	94	274	263	102	41-117	8	40
Pyrene	120	347	263	86	379	263	99	26-139	9	40
Benz(a)anthracene	6.8	276	263	103	282	263	105	32-134	2	40
Chrysene	13	255	263	92	265	263	96	27-135	4	40
Benzo(b)fluoranthene	11	296	263	108	316	263	116	31-136	7	40
Benzo(k)fluoranthene	11	265	263	96	287	263	105	32-131	8	40
Benzo(a)pyrene	13	320	263	117	337	263	123	26-146	5	40
Indeno(1,2,3-cd)pyrene	10	276	263	101	281	263	103	33-133	2	40
Dibenz(a,h)anthracene	ND	236	263	90	234	263	89	42-114	1	40
Benzo(g,h,i)perylene	12	253	263	92	260	263	94	31-122	3	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00074

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/07/2002
Sample Matrix:	Water	**Date Analyzed:**	10/15/2002

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3520C	**Units:**	ug/L
Analysis Method:	8270C SIM	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0207819

	Lab Control Sample KWG0207819-3 Lab Control Spike			
Analyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
Naphthalene	3.26	5.00	65	37-95
2-Methylnaphthalene	3.17	5.00	63	26-110
Acenaphthylene	4.13	5.00	83	44-103
Acenaphthene	3.64	5.00	73	41-97
Dibenzofuran	3.73	5.00	75	17-130
Fluorene	4.01	5.00	80	46-102
Phenanthrene	4.04	5.00	81	47-101
Anthracene	4.41	5.00	88	45-104
Fluoranthene	4.56	5.00	91	51-112
Pyrene	4.55	5.00	91	45-111
Benz(a)anthracene	4.65	5.00	93	50-111
Chrysene	4.29	5.00	86	51-108
Benzo(b)fluoranthene	4.82	5.00	96	54-114
Benzo(k)fluoranthene	4.55	5.00	91	51-117
Benzo(a)pyrene	5.51	5.00	110	51-119
Indeno(1,2,3-cd)pyrene	4.75	5.00	95	43-127
Dibenz(a,h)anthracene	4.41	5.00	88	47-119
Benzo(g,h,i)perylene	4.31	5.00	86	44-115

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00075

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Maul Foster & Alongi, Inc.	**Service Request:**	K2207133
Project:	Wacker/8128.01.04/3	**Date Extracted:**	10/09/2002
Sample Matrix:	Soil	**Date Analyzed:**	10/11/2002

Lab Control Spike/Duplicate Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8270C SIM	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0207967

	Lab Control Sample KWG0207967-5 Lab Control Spike			Duplicate Lab Control Sample KWG0207967-8 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	158	249	63	165	249	66	33-98	5	40
2-Methylnaphthalene	163	249	65	173	249	70	36-103	6	40
Acenaphthylene	178	249	71	188	249	75	41-102	6	40
Acenaphthene	169	249	68	180	249	72	41-97	6	40
Dibenzofuran	174	249	70	183	249	74	38-102	5	40
Fluorene	183	249	74	192	249	77	43-101	4	40
Phenanthrene	195	249	78	200	249	80	45-101	2	40
Anthracene	218	249	87	227	249	91	46-109	4	40
Fluoranthene	218	249	88	229	249	92	49-112	5	40
Pyrene	234	249	94	247	249	99	50-112	5	40
Benz(a)anthracene	236	249	95	245	249	98	52-114	3	40
Chrysene	220	249	88	233	249	93	54-109	6	40
Benzo(b)fluoranthene	257	249	103	285	249	114	54-115	10	40
Benzo(k)fluoranthene	239	249	96	265	249	107	54-115	11	40
Benzo(a)pyrene	262	249	105	281	249	113	54-120	7	40
Indeno(1,2,3-cd)pyrene	232	249	93	243	249	98	49-121	5	40
Dibenz(a,h)anthracene	212	249	85	224	249	90	48-114	5	40
Benzo(g,h,i)perylene	215	249	86	231	249	93	45-113	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00076

LABORATORY DATA
QUALITY ASSURANCE/QUALITY CONTROL REVIEW

WACKER SILTRONIC CORPORATION
September/October 2002
8128.01.04/3

This memorandum reviews the analytical results for soil and groundwater samples collected by the Maul Foster & Alongi, Inc. (MFA) project team on the Wacker Siltronic Corporation site in Portland, Oregon. The samples were collected in September and October, 2002.

Columbia Analytical Services, Inc. (CAS), in Kelso, Washington performed the analyses. CAS report numbers K2206967, K2207046, K2207133, and K2207229 were reviewed. The analyses performed are listed below.

Analysis	Reference
Volatile Organic Compounds (VOCs)	USEPA 8260B
Polycycloc Aromatic Hydrocarbons (PAHs)	USEPA 8270C-SIM
Total Cyanide	USEPA 335.2

USEPA = U.S. Environmental Protection Agency
SIM = Selected Ion Monitoring

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable portions of USEPA procedures (USEPA, 1994a, 1999), and appropriate laboratory and method-specific guidelines (CAS, 2002; USEPA, 1986).

The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

Holding Times, Preservation, and Sample Storage

Holding Times

Extractions and analyses were performed within the recommended holding time criteria, except for 8260B analyses for samples GP5-S-13.0, GP5-S-21.0, and GP5-S-26.0. These

samples were analyzed 2 days past the holding time limit of 14 days. The reviewer took no action, as the exceptions are considered minor.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

Blanks

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. No target analytes were detected above the CAS method reporting limits (MRLs) in the method blanks, except naphthalene (at 0.048 micrograms per liter [ug/L]) in one 8270C-SIM blank. For purposes of data qualification, the method blank was associated with all samples prepared on the same day as the method blank. If an analyte was detected in a sample that was also detected in the associated method blank, the sample result was qualified if the concentration was less than five times the method blank concentration (USEPA, 1999). Sample results were qualified by elevating the MRL to the concentration detected in the samples and qualified as not detected "U" at the elevated MRL. The reviewer qualified the 8270C-SIM naphthalene result (0.036 ug/L) for the associated sample (GP7-W-78.0) as 0.036 U.

Trip Blanks

Four trip blanks were submitted during this sampling event. One trip blank was analyzed for this sampling event. No target analytes were detected above the CAS method reporting limits (MRLs) in the analyzed trip blank.

Equipment Rinsate Blanks

Equipment rinsate blanks were not required for this sampling event. The samples were collected using dedicated single-use, sampling equipment.

Surrogate Recovery Results

The samples were spiked with surrogate compounds to evaluate laboratory performance on individual samples. Except for those listed below, all surrogate recoveries were within advisory quality control limits.

Sample	Method	Surrogate	Percent Recovery	Acceptance Limits
GP4-S-7.5	8260B	Dibromofluorobenzene	0	41 - 152
GP4-S-7.5	8260B	Toluene-d8	0	32 - 166
GP4-S-7.5	8260B	4-Bromofluorobenzene	0	40 - 153
GP4-S-7.5	8270C-SIM	Fluorene-d10	227	43 - 98
GP4-S-7.5	8270C-SIM	Fluoranthene-d10	347	52 - 108
GP4-S-7.5	8270C-SIM	Terphenyl-d14	172	61 - 122
GP6-S-23.0	8270C-SIM	Fluorene-d10	0	43 - 98

Sample	Method	Surrogate	Percent Recovery	Acceptance Limits
GP6-S-23.0	8270C-SIM	Fluoranthene-d10	0	52 - 108
GP6-S-23.0	8270C-SIM	Terphenyl-d14	0	61 - 122
GP7-S-15.5	8260B	Dibromofluorobenzene	82	84 - 121
GP7-S-15.5	8260B	Toluene-d8	78	80 - 125
GP7-S-15.5	8260B	4-Bromofluorobenzene	78	80 - 123
GP7-S-15.5	8270C-SIM	Fluoranthene-d10	155	52 - 108
GP7-S-30.0	8270C-SIM	Fluoranthene-d10	154	52 - 108
GP5-S-21.0	8270C-SIM	Fluoranthene-d10	111	52 - 108

Based on 0% recoveries for three surrogates, all positive 8260B results for sample GP4-S-7.5 were qualified as estimated "J" and elevated MRLs for non-detects were qualified as estimated "UJ". The reviewer took no action based on 8270C-SIM surrogate outliers for samples GP4-S-7.5 and GP6-S-23.0, as the samples required dilution due to high contaminanant concentrations. The reviewer took no action based on 8270C-SIM fluoranthene-d10 percent recoveries for samples GP5-S-21.0, GP7-S-15.5, and GP7-S-30.0, as all other surrogates were within acceptance limits. The reviewer took no action based on 8260B surrogate percent recoveries for sample GP7-S-15.5, as the outliers were minor.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

MS/MSD results are used to evaluate laboratory precision and accuracy. All MS/MSD samples were extracted and analyzed at the required frequency. All recoveries and relative percent differences (RPDs) were within acceptance limits or did not apply, except for GP6-S-15.0 8270C-SIM MSD percent recoveries and K2207133 Batch 8270C-SIM liquid MS/MSD RPDs. The reviewer took no action based on MS/MSD outliers, as all other Batch QC was within acceptance limits.

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Results

An LCS is spiked with target analytes to provide information on laboratory accuracy. The LCS samples were extracted and analyzed at the required frequency. Except for sporadic minor 8260B outliers, which were appropriately noted by the laboratory, all LCS/LCSD analytes were within acceptance limits for percent recovery and RPD. The review took no further action based LCS/LCSD results.

Field Duplicate Results

Field duplicate samples measure both field and laboratory precision. One field duplicate was submitted for analysis (GP6-W-98.0/GP-DUP). MFA uses an acceptance criteria of a factor of five for results which are less than five times the MRL or a factor of two for results which are greater than five times the MRL. All analytes were within the acceptance criteria.

Method Reporting Limits

CAS used routine MRLs for non-detect results with the exception of the following samples, which required dilutions due to high analyte concentrations and/or matrix interferences:

- Groundwater samples GP5-W-95.0, GP6-W-98.0, GP7-W-78.0, GP7-W-98.0, and GP-DUP for 8260B.
- Soil samples GP5-S-13.0 and GP5-S-21.0 for 8270C-SIM.

Data Package

The data packages were reviewed for transcription errors, omissions, or anomalies. None were found.

REFERENCES

Columbia Analytical Services (CAS). 2002. *Quality Assurance Manual.* Columbia Analytical Services, Inc., Kelso, Washington.

USEPA (United States Environmental Protection Agency). 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.* U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA-530/SW-846. September (update 1, July 1992; update 2a, August 1993; update 2, September 1994; update 2b, January 1995).

USEPA (U.S. Environmental Protection Agency). 1994a. *USEPA contract laboratory program, national functional guidelines for inorganics data review.* Office of Emergency and Remedial Response, U.S. Environmental Protection Agency. EPA 540/R-94/013. February.

USEPA (United States Environmental Protection Agency). 1999. *USEPA Contract Laboratory Program, National Functional Guidelines for Organics Data Review.* Office of Emergency and Remedial Response, U.S. Environmental Protection Agency. EPA 540/R-99/008. October.

Limno-Tech, Inc.
Environmental Engineering

March 6, 2002

Mr. Eric Blischke
Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

RE: Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon.

Dear Mr. Blischke:

In your January 7, 2002 letter to Mr. Bob Wyatt of Northwest Natural regarding the *Data Package for Focused Remedial Investigation* submitted by Hahn and Associates (Hahn) on November 20, 2001, you requested an investigation of the 1984 TCE spill area on the Wacker Siltronic Corporation property (Wacker Siltronic). This letter presents a workplan for that investigation to be conducted by Limno-Tech, Inc (LTI) on behalf of Wacker Siltronic. It is our understanding that Northwest Natural and their consultant will address the other items identified in your letter to Mr. Wyatt.

This workplan summarizes the objective, rationale, methodology, and deliverables associated with the planned work. To facilitate your review of this workplan, LTI intends to follow the methods and procedures described in the *Final Focused Remedial Investigation Sampling & Analysis Plan* (SAP) previously prepared by Hahn for the Wacker Siltronic remedial investigation with the exceptions noted below.

Objective

The objective of the remedial investigation activities described in this workplan is to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the 1984 TCE spill at Wacker Siltronic. Therefore, the investigation will consist of soil and groundwater sampling at and near the 1984 TCE spill location, with analysis for TCE and its daughter compounds (1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene and vinyl chloride). In addition, at the March 1, 2001 meeting at the Oregon Department of Environmental Quality (ODEQ) Northwest Regional Offices to discuss the responses to your January 7, 2002 letter to Bob Wyatt of NW Natural, you requested that parameters be analyzed to evaluate the presence

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of petroleum substances related to the former GASCO site investigations. To expedite this request, samples will also be analyzed for the main petroleum indicator compounds including benzene, toluene, ethylbenzene and xylenes (BTEX), and polynuclear aromatic hydrocarbons (PAHs), but none of the other compounds that are noted in the Hahn SAP (semivolatile organics, metals, cyanide, chloride and total organic carbon). The petroleum indicator compound data will be used by NW Natural to supplement their currently ongoing Focused Remedial Investigation. The scope of the investigation to accomplish this supplemental remedial investigation is described below.

Sampling Scope and Rationale

The investigation of the 1984 TCE release area involves soil and groundwater sampling at the three locations depicted on the attached map, which are labeled GP02-01, GP02-02, and GP02-03. Soil and groundwater samples will be collected at these locations and analyzed for TCE and its daughter products and the petroleum indicator compounds. These locations were selected to address specific questions about the 1984 TCE release:

- GP02-01: This is the approximate location of the 1984 TCE release. Immediately after the release occurred, soil was excavated for off-site disposal to remediate local soil impacts from the release. Confirmatory sampling indicated residual TCE concentrations in soil of less than 1 mg/kg. If sampling at this location does not reveal residual impacts of the TCE spill in soil and groundwater, it will be concluded that the soil removal action conducted immediately following the release was successful in preventing TCE and its daughter products from reaching groundwater at this location.
- GP02-02: This location coincides with the approximate location of a historical surface drainage way. If the historical drainage way is at this location, it should be possible to identify it through standard visual/manual soil characterization techniques in the field. If sampling at this location does not reveal detectable concentrations of TCE or its daughter products in soil and groundwater, it will be concluded that the TCE released in 1984 did not reach this location and no further investigation in this area will be planned.
- GP02-03: GP02-03 is located in the approximate location of the drainage way and between the historic TCE spill location and the river. If TCE and its daughter products are not detected in soil at this location, it will be concluded that the historical drainage way did not act as a preferential pathway for the migration of these chemicals; and that the 1984 TCE release did not cause the chlorinated VOC impacts detected in groundwater along the riverbank, especially at sampling locations P-2 and P-3. It will further be concluded that the 1984 TCE release did not contribute to contamination of sediments in Portland Harbor.

If detectable concentrations of TCE or its daughter products are encountered in soil and/or groundwater at any of these locations, the data will be evaluated to determine the need for additional investigation or remediation. If necessary or appropriate, additional investigations will be planned to investigate whether the measured impacts are a result of the 1984 TCE release or from migration from other sources. If the need for additional

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sampling is supported by the data collected during the planned investigation, a supplemental plan will be submitted to ODEQ for review.

Sampling Methodology

At each of the proposed sampling locations, a hydraulic push-probe (e.g., Geoprobe®) boring will be advanced for subsurface lithological characterization and sampling. Soil will be sampled using a four foot long core sampling device to allow continuous characterization of soil from ground surface downward until saturated conditions are encountered (expected to be approximately 28 ft. bgs). Continuous coring for subsurface lithological characterization will be continued in the saturated zone to an approximate depth of 60 feet below surface grade, if site conditions permit. Below this, characterization will be performed every 10 feet (e.g., one four foot long core will be collected in every 10 foot depth interval) to a total attempted depth of 100 ft. bgs.

All soil cores will be screened with a portable photoionization detector (PID). The additional screening techniques (olfactory, sheen, ultraviolet fluorescence, and dye methods) listed in the SAP will not be conducted. Up to three soil samples will be collected for laboratory analysis as follows: at each location, soil samples will be collected at three feet below grade and just above the depth at which saturation occurs. A soil sample will also be collected from the depth interval at which the PID yields the highest response. If the highest PID response occurs at three feet below grade or just above the depth at which saturation occurs (pre-specified sampling depths), the location of the third sample will be determined by the judgment of the field supervisor. These soil samples will be analyzed for TCE or its daughter products using USEPA SW-846 Method 8260b, in accordance with the Sampling and Analysis Plan (SAP). In addition, the soil samples will be analyzed for petroleum indicator compounds using USEPA SW-846 Method 8260b for BTEX and USEPA SW-846 Method 8270 for PAHs.

Groundwater will also be sampled at each of the proposed sampling locations to evaluate groundwater impacts from the 1984 TCE release. Groundwater will be sampled at depths of 28-32 feet below ground surface (ft. bgs), 56-60 ft. bgs, and 96-100 ft. bgs. Groundwater samples will be collected from the proposed sampling locations using methods described in the SAP and analyzed for volatile organic compounds using USEPA SW-846 Method 8260b. In addition, the groundwater samples will be analyzed for petroleum indicator compounds using USEPA SW-846 Method 8260b for BTEX and USEPA SW-846 Method 8270 for PAHs.

If unforeseen conditions require relocation of borings, or if other changes to the scope of work outlined herein are required because of field conditions, those changes and the reason for them will be described in a report to be completed following implementation of this workplan. Such changes may be necessitated by the presence of underground utilities or other structures.

The methodologies to be used for implementation of the work described herein are described in the SAP prepared by Hahn for previous investigations on GASCO and Wacker Siltronic, which are attached. If circumstances require deviation from the sampling and analytical procedures outlined in the SAP, the variances will be reported

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with the data. All site investigation activities described in this workplan will be conducted under the supervision of an Oregon Registered Geologist or other qualified and experienced environmental professional.

Quality Assurance

For expediency, we will follow the quality assurance procedures described in the (SAP) prepared by Hahn for previous investigations on the Wacker Siltronic site. If circumstances require deviation from the quality assurance procedures outlined in the SAP, the variances will be reported with the data.

Health and Safety

Procedures and measures to protect worker health and safety are described in the attached site-specific Health and Safety Plan (HASP) prepared by LTI.

Deliverables

Upon completion of all tasks described in this plan, a report will be prepared and submitted for review by your agency. The report will include:

- A description of the activities conducted under this scope of work
- Maps showing sampling locations and presenting the data collected
- Copies of all data reports and boring construction logs
- A written summary and interpretation of the data collected

If review of the data collected during this investigation indicates the need for additional data collection, a supplemental investigation workplan will be submitted to ODEQ for review.

Schedule

LTI, on behalf of Wacker Siltronic, proposes to conduct the investigation activities described herein during the same time frame as the supplemental investigation activities that will be conducted by Northwest Natural.

If you have any questions about this workplan or need additional information, please call me at 503-248-1768.

Sincerely,

Kathi Futornick

Kathi Futornick
Northwest Regional Manager
Limno-Tech, Inc.

Attachments

cc: Cathryn Young

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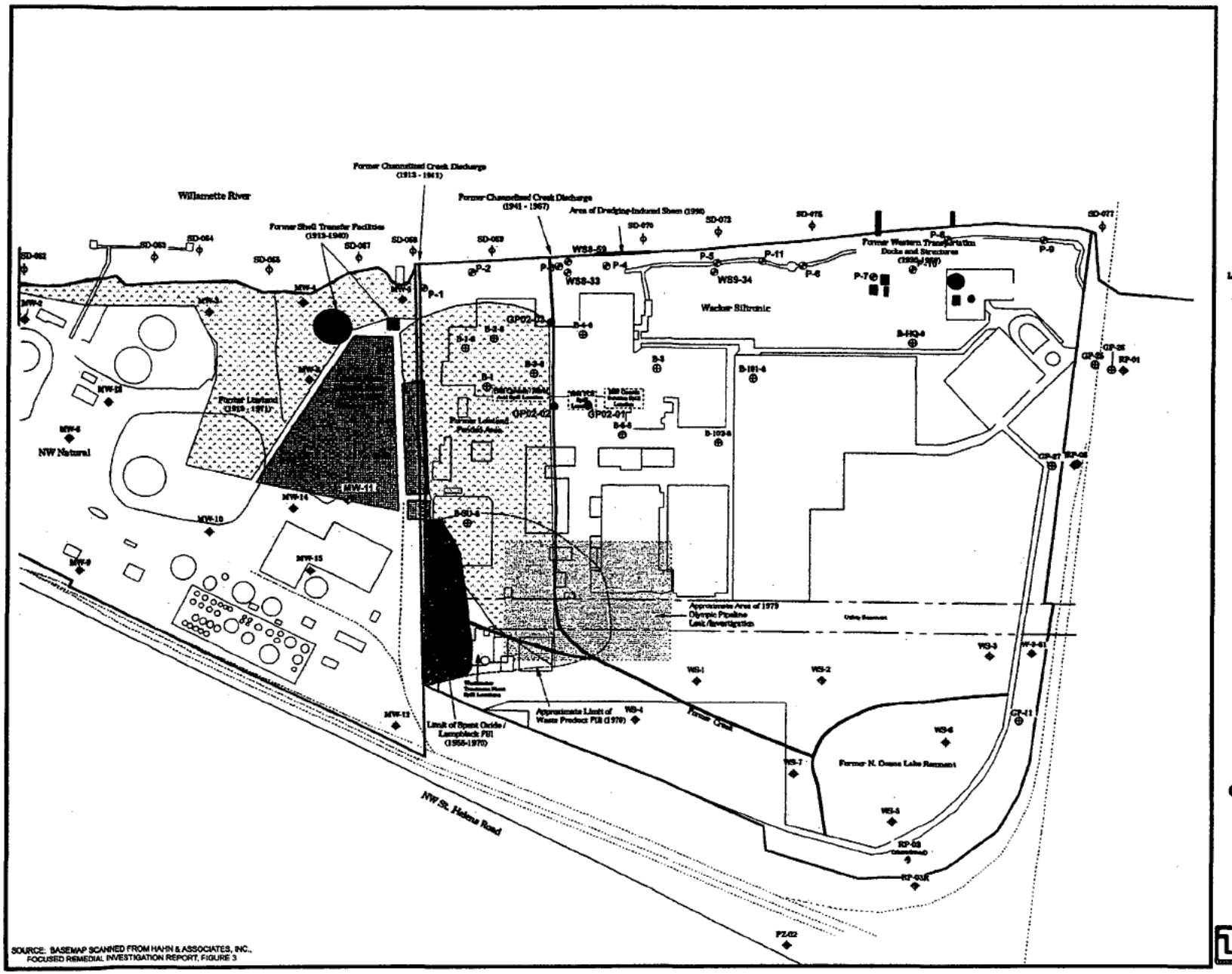

N

0 250 500
Approximate Scale in Feet

LEGEND

- Site Boundary
- Existing Structures or Feature
- Railroad Tracks
- Existing Monitoring Well Location
- EPA Sediment Sample Location
- Select Boring Location
- Proposed Monitoring Well Location
- Proposed Geoprobe Location

PROPOSED SOIL AND GROUNDWATER SAMPLING LOCATIONS

LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

Health and Safety Plan
For Soil and Groundwater Sampling

Wacker Siltronic Site,
Portland, Oregon

LTI Environmental Engineering
A Division of Limno-Tech, Inc.

Ann Arbor, Michigan

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1. INTRODUCTION

This Health and Safety Plan (HASP) was prepared for the Wacker Siltronic site (the Site), located on Portland Harbor in Portland, Oregon. This section of the HASP defines general applicability and general responsibilities with respect to compliance with Health and Safety programs.

1.1 SCOPE AND APPLICABILITY OF THE HEALTH AND SAFETY PLAN

The purpose of this HASP is to define the requirements and designate protocols to be followed at the Site during investigation and remediation activities. Applicability extends specifically to all employees and affiliates, and generally to any other project related contractors, subcontractors, and visitors. Employees of other consulting firms and contracted companies will work in accordance with their own independent HASPs, provided that the minimum requirements of this plan are fulfilled.

All personnel on site, contractors and subcontractors included, shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This HASP summarizes those hazards in Table 1 and Appendix A, and defines protective measures planned for the site. All personnel prior to entering the site must review this plan, and/or its equivalent.

During development of this plan consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- EPA, OERR ERT Standard Operating Safety Guides
- OSHA/NIOSH/EPA/USCG Occ. Health and Safety Guidelines
- NIOSH Pocket Guide to Chemical Hazards

1.2 VISITORS

All visitors entering the work area will be required to read and verify compliance with the provisions of this HASP. In addition, visitors will be expected to comply with relevant OSHA requirements such as training (Sec. 4.0), medical monitoring (Sec. 6.0), and respiratory protection (if applicable). Visitors, contractors, and other consultants will also be expected to provide their own protective equipment.

In the event that a visitor does not adhere to the provisions of the HASP, he/she will be requested to leave the work area.

2. ORGANIZATIONAL RESPONSIBILITY/KEY PERSONNEL

Technical Project Director: Kathi Futornick (LTI)

The technical project director is responsible for staffing and the overall administration of all aspects of the project.

Technical Project Manager: Robert Betz, CHMM (LTI)

The project manager is responsible for oversight of all aspects of the project including health and safety, quality assurance and on-site activities.

Project Scientists/Engineers: Joyce Dunkin, CPG (LTI), Christina Glastris (LTI)

The project scientists/SSOs are responsible for on-site activities including: sampling, preparation of boring logs, quality assurance, and field implementation of the health and safety. The project scientists/SSOs report to the technical project manager.

QA/QC Officer: Robert Betz, CHMM (LTI)

The QA/QC officer is responsible for the development, implementation and oversight of the QA/QC program for the site, and report to the project manager.

Health and Safety Officer: Robert Betz, CHMM (LTI)

The HSO is responsible for providing corporate health and safety support/oversight for on-site health and safety and employee exposure meeting.

Site/Facility Representative: Cathryn Young (Wacker)

The site/facility representative has the responsibility for addressing the legal and environmental requirements of the regulatory agency, generally through coordination between the technical project director or project manager and the regulatory agency project manager.

3. SAFETY AND HEALTH RISK ANALYSIS

3.1 SITE BACKGROUND

This HASP defines the hazards and methods to protect personnel from those hazards as identified in previous site work or background information. The evaluation of hazards is based upon the knowledge of site background.

The current or upcoming site activities will involve:

- Soil boring, to be conducted using direct-push (Geoprobe©) methods.
- Field characterization (visual/manual) of site soils to describe lithology.
- Collection of soil samples for laboratory analysis.
- Collection of groundwater samples for laboratory analysis.

The following subsections describe the chemical and physical hazards associated with activities at the site. In addition, the protective measures to be implemented during these activities are identified.

3.2 CHEMICAL/PHYSICAL HAZARDS

Table 1 provides a list of chemicals that may be encountered in soil and/or groundwater at the Site, maximum recorded concentrations in soil and groundwater, and the generic Material Safety Data Sheet (MSDS) numbers for each. Complete data were not available in preparing this HASP, therefore the maximum concentrations listed represent only the data available in the *Data Package for Focused Remedial Investigation for the Wacker Siltronic Corporation Property* (Hahn & Associates, November 20, 2001). The MSDSs are located in Appendix A and provide specific information on the health and safety hazards posed by each chemical.

Table 1: Chemicals Previously Detected in Site Media

Chemical Name	Maximum Concentration Encountered	
	Soil (mg/kg)	Groundwater (mg/L)
1,1-dichloroethene	---	0.0126
1,2-dichlorobenzene	---	0.425
1,3-dichlorobenzene	---	0.0151
1,4-dichlorobenzene	---	0.155
1,2,4-TMB	16	---
1,3,5-TMB	5.61	---
2-Methylnaphthalene	2180	0.0828
Acenaphthene	2770	0.0987
Acenaphthylene	151	0.00117
Anthracene	997	0.0191
Antimony	1.85	0.022
Arsenic	4.2	0.034
Barium	---	1.08
Benzene	8.63	0.117
Benzo(a)anthracene	817	0.0042
Benzo(a)pyrene	1280	0.00423
Benzo(b)fluoranthene	638	0.00212
Benzo(ghi)perylene	1120	0.00251
Benzo(k)fluoranthene	743	Nd
Bis (2-chloroisopropyl)ether	---	0.017
Butyl benzyl phthalate	---	0.0222
Cadmium	1.04	ND

Chemical Name	**Maximum Concentration Encountered**	
	Soil (mg/kg)	Groundwater (mg/L)
Carbazole	413	0.0565
Chromium	20.4	0.61
Chlorobenzene	---	0.199
Chrysene	940	0.00534
Cis-1,2-dichloroethene	ND	6.780
Cobalt	13.2	0.134
Copper	37.6	0.327
Cyanide, Total	15,000	0.468
Dibenzo (ah) anthracene	143	ND
Dibenzofuran	230	0.00629
Diethyl phthalate	---	0.0071
Ethylbenzene	15.7	0.041
Fluoranthene	3020	0.0268
Fluorene	1240	0.043
Indeno(1,2,3-cd)pyrene	623	0.00011
Iron	25,200	457
Lead	75.3	0.036
Magnesium	---	152
Manganese	269	28.9
Naphthalene	60,900	0.933
n-butylbenzene	0.57	---
Nickel	45.3	0.351
n-propylbenzene	0.225	---
Phenanthrene	6650	0.0883
Pyrene	3400	0.028
Sec-butylbenzene	1.92	---
Selenium	ND	0.016

Chemical Name	**Maximum Concentration Encountered**	
	Soil (mg/kg)	Groundwater (mg/L)
Silver	ND	ND
Titanium	1,570	11.7
Toluene	2.04	0.0041
trans-1,2-dichloroethene	ND	0.0219
Trichloroethene	ND	11.2
Vanadium	67.3	0.635
Vinyl chloride	ND	0.129
Xylene	23.88	0.0223
Zinc	244	1.69

ND = not detected
--- = not reported

Appendix B describes the hazards and preventative actions for the work tasks at the site, as well as general safety rules. Possible exposures to chemicals at the site during the work activities will be controlled and minimized through the use of personal protective equipment and proper standard operating procedures. Standard operating procedures for personal protective clothing and equipment are presented in Appendix C. It is not anticipated that this project will include tasks to be implemented in confined spaces.

4. PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA's 29 CFR 1910.120 regulation covering Hazardous Waste Operations and Emergency Response, all site personnel should be trained in accordance with the standard. At a minimum, all personnel are required to be trained to recognize the hazards on-site, the provisions of this HASP, and the responsible personnel.

4.1 PREASSIGNMENT AND ANNUAL REFRESHER TRAINING

Prior to arrival on-site, each employer will be responsible for certifying that his/her employees meet the requirements of preassignment training. Consistent with OSHA 29 CFR 1910.120 paragraph (e)(3), each employee should be able to provide a document certifying dates of 24 hours of training for workers occasionally on-site for a specific task, or 40 hours of training for general site workers. An employer may also grandfather experienced personnel. Personnel must receive 8 hours of annual refresher training.

5. PERSONAL PROTECTIVE EQUIPMENT

This section describes the general requirements of the EPA designated Levels of Protection (A-D), and the specific levels of protection required for each task at the Site.

5.1 LEVELS OF PROTECTION

Personnel wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full facepiece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact.

The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.

- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgment until the hazards can be better identified. Standard operating procedures for inspecting personal protective equipment are presented in Appendix B.

5.2 SELECTED LEVEL OF PROTECTION

For all activities conducted at this site, modified Level D protection is appropriate. The personal protective equipment (PPE) modifications provide for a higher level of skin protection from contact with the media (sediments and groundwater) being handled. Modified level D PPE includes, where necessary to minimize unacceptable exposures to health and safety hazards:

- Coveralls: Tyvek, Saranex, rubber waders, rain gear, etc.
- Gloves: rubber, vinyl, latex, nitrile, etc.
- Boots/shoes: Chemical resistant boots with a steel toe and shank, chemically resistant overboots
- Safety glasses or plastic face shield
- Hardhat

5.3 REASSESSMENT OF PROTECTION PROGRAM

The Level of Protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions or findings of investigations.

When a significant change occurs, the hazards should be reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase, such as work that begins on a different portion of the site.
- Change in job tasks during a work phase.
- Change of season/weather.
- When temperature extremes or individual medical considerations limit the effectiveness of PPE.
- Contaminants other than those previously identified are encountered.
- Change in ambient levels of contaminants.
- Change in work scope which effects the degree of contact with contaminants.

5.4 WORK MISSION DURATION

Work mission duration limitations related to wearing PPE are variable and dependent upon:

- Air supply consumption with a Level A or B SCBA unit - air supply will be monitored and work will be halted prior to consumption of the entire supply.

- Permeation and penetration of protective clothing - work duration will be limited to permeation or "breakthrough" times associated with the protective clothing equipment materials used so that new protective clothing/equipment may be donned. Penetration through leakage of fasteners or valves on PPE will be inspected for and if found indicate stoppage of all work until the situation is remedied.

- Ambient temperature extremes - heat or cold stress will be monitored by each worker so that sufficient means (use of appropriate PPE heating/cooling packs, rest breaks, etc.) can be implemented to avoid these conditions.

Segments of work while wearing SCBA will generally have a shorter work duration. However, at all times conditions will be monitored by all site workers so that work task duration can be adjusted to appropriate and safe periods of time. Before the workers actually begin work in their PPE ensembles, the anticipated duration of the work mission should be established.

6. MEDICAL SURVEILLANCE REQUIREMENTS

Medical monitoring programs are designed to track the physical condition of employees on a regular basis as well as survey preemployment or baseline conditions prior to potential exposures. All employees will have medical monitoring in compliance with OSHA regulations. The medical monitoring program is a part of each employers Health and Safety program. The remainder of this section applies only to employees who conduct field investigations at sites where PELs will be exceeded more than thirty days each year or who require respirators to conduct field activities.

6.1 BASELINE OR PREASSIGNMENT MONITORING

Prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials, each employee must receive a preassignment or baseline physical. The content of the physical is to be determined by the employers medical consultant. As suggested by NIOSH/OSHA/USCG/EPA's Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities, the minimum medical monitoring requirements for work at the Site is as follows:

· Complete medical and work histories.
· Physical examination.
· Pulmonary function tests (FVC and FEV1).
· Chest X-ray (every 2 years).
· EKG.
· Eye examination and visual acuity.
· Audiometry.
· Urinalysis.
· Blood chemistry, including hematology, serum analyses, and heavy metals toxicology.

The preassignment physical should categorize employees as fit-for-duty and able to wear respiratory protection.

6.2 PERIODIC MONITORING

In addition to a baseline physical, all employees require a periodic physical within the last 12 months unless the advising physician believes a shorter interval is appropriate. The employers medical consultant should prescribe an adequate medical monitoring which fulfills OSHA 29 CFR 1910.120 requirements. The preassignment medical monitoring outlined above may be applicable.

All personnel working in contaminated or potentially contaminated areas at the Site will verify currency (within 12 months) with respect to medical monitoring. This is done by indicating date of last physical on the safety plan agreement form.

6.3 SITE SPECIFIC MEDICAL MONITORING

No site specific medical monitoring will be implemented.

6.4 EXPOSURE/INJURY/MEDICAL SUPPORT

As a follow-up to an injury or possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it is critical to perform follow-up testing within 24-48 hours. It will be up to the employers medical consultant to advise the type of test required to accurately monitor for exposure effects.

6.5 EXIT PHYSICAL

At termination of employment or reassignment to an activity or location that does not represent a risk of exposure to hazardous exposures, an employee shall require an exit physical. If his/her last physical was within the last 6 months, the advising medical consultant has the right to determine adequacy and necessity of exit exam.

7. PERSONAL AIR MONITORING/SAMPLING

Because confined-space entry is not planned as part of the scope of work, personal air monitoring will not be performed during site activities. Workspace air monitoring during boring and sampling activities will be performed using a photo-ionization detector (PID) or flame-ionization detector (FID), as appropriate.

8. NEAREST MEDICAL ASSISTANCE

The Good Samaritan Hospital is the nearest medical facility to the Site and is located approximately 5.1 miles away from the site. The directions to the hospital are given below:

1. Start out going Southeast on NW Front Ave. towards NW 61st Ave. by turning left. (0.9 miles)
2. Turn right onto NW 61st Ave. (0.2 miles)
3. NW 61st Ave. becomes NW Culebra Ave. (0.1 miles)
4. NW Culebra Ave. becomes NW Balboa St. (0.1 miles)
5. Turn left onto NW St. Helens Rd. (0.9 miles)
6. Stay straight to go onto NW Yeon Ave. (2.0 miles)
7. Turn right onto NW Nicolai St./US-30. (0.1 miles)
8. Turn left onto NW 23rd Pl. (0.1 miles)
9. Turn left onto NW York St. (0.1 miles)
10. Turn right onto NW 23rd Ave. (0.4 miles)
11. Turn left onto NW Quimby St. (0.1 miles)
12. Turn right onto NW 22nd Ave. (0.2 miles)

Figure 1 provides a map of the route to the nearest medical facility, which can provide emergency care for individuals who may experience an injury or exposure on-site. The route to the hospitals should be verified by the HSO, and should be familiar to all site personnel.

9. DECONTAMINATION PLAN

Standard decontamination procedures for equipment and materials will be used to avoid spread of chemical impacts and cross-contamination between samples. Decontamination for hand-held sampling equipment will include:

- Detergent scrub using a solution of Alconox, Liquinox, or equivalent.
- Tap water rinse.
- Distilled water rinse.

If a detergent scrub is not feasible, such as is the case for reusable tubing, the decontamination procedure will include a triple water rinse. Large equipment will be decontaminated by high-pressure/hot water spray, as necessary. Subcontractors will be responsible for decontamination of their own equipment.

10. EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This plan is compatible with local, state and federal disaster and emergency management plans as appropriate.

10.1 PRE-EMERGENCY PLANNING

During the site briefings held periodically/daily, all employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation routes. Appendix B identifies the hazardous conditions associated with specific site activities. The plan will be reviewed and revised if necessary, on a regular basis by the HSO. This will ensure that the plan is adequate and consistent with prevailing site conditions.

10.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The Site Supervisor has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area, and evacuation of adjacent residents. He/she is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. The HSO may be called upon to act on the behalf of the site supervisor, and will direct responses to any medical emergency. The individual contractor organizations are responsible for assisting the project manager in his/her mission within the parameters of their scope of work.

10.3 EMERGENCY RECOGNITION/PREVENTION

Appendices A and B provide a listing of chemical and physical hazards onsite. Personnel will be familiar with techniques of hazard recognition from preassignment training and site specific briefings. The HSO is responsible for ensuring that prevention devices or equipment is available to personnel.

10.4 EMERGENCY CONTACT/NOTIFICATION SYSTEM

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization. In the event of a fire or spill, the site supervisor will notify the appropriate local, state, and federal agencies.

Organization	Telephone
Limno-Tech, Inc. (LTI)	(503) 248-1768
Cathryn Young (Wacker)	(503) 243-2020
Ambulance	911
Police Department	911
Fire Department	911
Good Samaritan Hospital Emergency Room	(503) 413-7260
Poison Control Center	(800) 382-9097
National Response Center	(800) 424-8802
Chemtrec	(800) 424-9555

10.5 EMERGENCY MEDICAL TREATMENT PROCEDURES

For any person who becomes ill or injured, first aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must be reported immediately to the project manager.

Any person being transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included in Table 1 and Appendix A.

Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

10.6 FIRE OR EXPLOSION

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials onsite.

If it is safe to do so, site personnel may:

- Use fire fighting equipment available onsite to control or extinguish the fire; and,

- Remove or isolate flammable or other hazardous materials, which may contribute to the fire.

10.7 SPILL OR LEAKS

In the event of a spill or a leak, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely and;
- Begin containment and recovery of the spilled materials.

10.8 EMERGENCY EQUIPMENT/FACILITIES

The following emergency equipment is located in the company vehicle, unless otherwise specified.

Description	Location
Telephone:	company vehicle
Fire Extinguisher:	company vehicle
First Aid Kit:	company vehicle
water	company vehicle

10.9 ENCOUNTERING CHEMICAL IMPACTS

If an employee notices visibly obvious chemical impacts that was not anticipated prior to conducting the work activities, he/she should notify his/her supervisor immediately. The site supervisor will then confer with the project manager or other appropriate personnel.

FIGURES

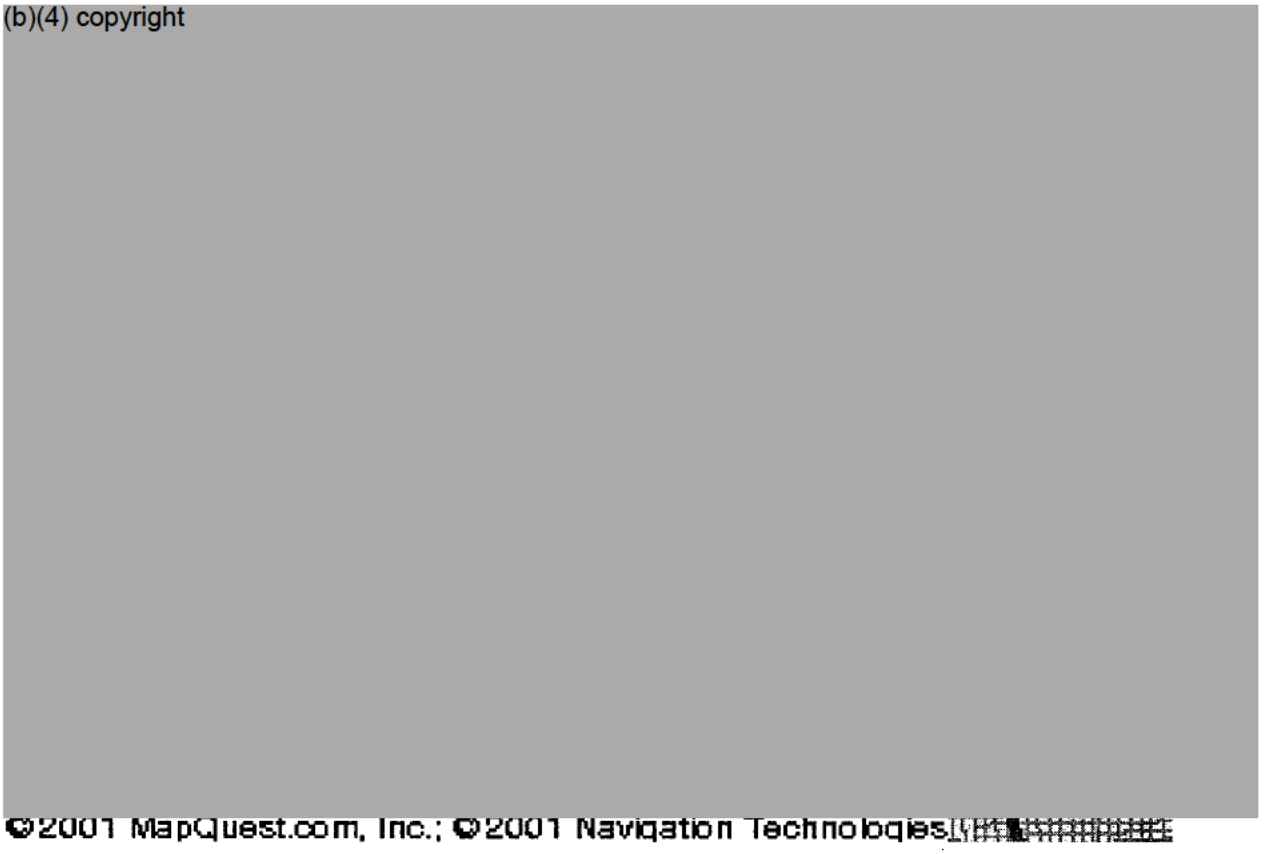

Figure 1: Location of Nearby Medical Facility

APPENDIX A:
MATERIAL SAFETY DATA SHEETS

APPENDIX B:
TASK HAZARD DESCRIPTIONS AND GENERAL SAFETY RULES

SURFACE AND SUBSURFACE SOIL SAMPLING

For the purposes of hazard identification, surface and subsurface soil sampling will be considered any soil sampling completed by hand using a trowel, split spoon, shovel, auger or other type of handheld tool. Hazards generally associated with soil and tailings/spoils sampling include:

- Contact with or inhalation of chemicals, potentially in high concentrations in sampling media.
- Back strain and muscle fatigue due to lifting, shoveling and augering techniques.
- Contact with or inhalation of decontamination solutions.

HAZARD PREVENTION

- To minimize exposure to chemicals, a thorough review of suspected chemicals should be completed along with implementation of an adequate protection program.
- Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back strain. Use slow easy motions when shoveling, augering and digging to decrease muscle strain.
- Material Safety Data Sheets for all decon solutions should be included with each Site Health and Safety Plan.
- First aid equipment should be available based on MSDS requirements.

SOIL BORINGS AND MONITORING WELL INSTALLATION

Hazards generally associated with drilling operations include the following:

- Noise levels exceeding the OSHA PEL of 90 dBA are both a hazard and a hindrance to communication.
- Fumes (carbon monoxide) from the drill rig.
- Overhead utility wires, i.e. electrical and telephone, can be hazardous when the drill rig boom is in the upright position.
- Underground pipelines and utility lines can be ruptured or damaged during active drilling operations.
- Moving parts, i.e. augers, on the drill rig may catch clothing. Free or falling parts from the cat head may cause head injury.
- Moving the drill rig over uneven terrain may cause the vehicle to roll over or get stuck in a rut or mud. Be aware of hazards associated with moving heavy machinery and other associated injury.
- High pressure hydraulic lines and air lines used on drill rigs are hazardous when they are in ill repair or incorrectly assembled.
- Vehicular traffic may excessive, particularly on small sites or on public property.

HAZARD PREVENTION

- Review the chemicals suspected to be onsite and perform air monitoring as required. Shut down the drill rig and/or divert exhaust fumes.
- All chains, lines, cables should be inspected daily for weak spots, frays, etc.
- Ear muffs and ear plugs effectively reduce noise levels.
- Hardhats should be worn at all times when working around a drill rig. Secure loose clothing. Check boom prior to approaching the drill rig.
- To avoid contact with any overhead lines, the drill rig boom should be lowered prior to moving the rig. Overhead utilities should be considered "live" until determined otherwise.
- The rig mast should not be erected within 30 feet of an overhead electrical line until the line is deenergized, grounded, or shielded and an electrician has certified that arcing cannot occur.

- Minimum working distances around "live" overhead power lines are:

Voltage Range (kilovolt)	Minimum Working Distance
2.1 to 15	2 ft. 0 in
15.1 to 35	2 ft. 4 in
35.1 to 46	2 ft. 6 in
46.1 to 72.5	3 ft. 0 in
72.6 to 121	3 ft. 0 in
138 to 145	3 ft. 6 in
161 to 169	3 ft. 8 in
230 to 242	5 ft. 0 in
345 to 362	7 ft. 0 in
500 to 552	11 ft. 0 in
700 to 765	15 ft. 0 in

- A thorough underground utilities search should be conducted before the commencement of a drilling project.
- All high pressure lines should be checked prior to and during use.
- Caution tape, safety cones and signs should delineate clearly those areas where work will be performed. Only authorized personnel should be allowed to enter demarcated zones.

GROUNDWATER SAMPLING

Hazards generally encountered during groundwater sampling include the following:

- Exposure to vapors of volatile organics when the well head is initially opened.
- Back strain due to lifting bailers or pumps from down-well depths and moving equipment (generators) to well locations.
- Electrical hazards associated with use of electrical equipment around water or wet surfaces.
- Possible water splashing in eyes during sampling.
- Vehicular traffic may excessive, particularly on small sites or on public property.

HAZARD PREVENTION

- To minimize exposure to volatiles when the well head is initially opened, a monitor instrument (HNU, OVA) should be placed near the opening to monitor organic levels. The breathing zone should also be monitored. The action levels on the instruments should be chosen according to the health and safety plan. To prevent contact with impacted groundwater, or product material, provide adequate protective equipment.
- Back strain can be prevented by employing proper lifting and bailing techniques. Heavy equipment, such as pumps and generators, should only be lifted with the legs, preferable using two or three personnel.
- Slipping on wet surfaces can be prevented by placing all purged water in drums for removal. Also, if the area is wet wear boots with good treads and be alert of where personnel are walking to decrease the chance of slipping.
- Ground fault interrupter should be used in the absence of properly grounded circuitry or when pumps are used around wet conditions.
- Electrical extension cords should be protected or guarded from damage (i.e. cuts from other machinery) and be maintained in good condition.
- Eye protection should be worn as appropriate to prevent water splashing into eyes.
- Caution tape, safety cones and signs should delineate clearly those areas where work will be performed. Only authorized personnel should be allowed to enter demarcated zones.

GENERAL SAFETY RULES:

1. On sites involving hazardous materials, eating, drinking, chewing gum and chewing tobacco will be allowed only in designated areas. All personnel are required to wash their hands and face immediately after completing work activities in an exclusionary zone.
2. Each employee shall comply with the safety rules, regulations, and orders which apply to his own actions and conduct, and shall not interfere with any method or process adopted for protection of any employee on any company property or project.
3. Never work alone in an isolated area unless arrangements have been made for periodic contact with another employee.
4. Watch for fire hazards. Know the location and operation for the fire extinguisher in your area. Check with your supervisor if in doubt. Report any fire extinguishers that are partly empty or otherwise inoperative.
5. Employees must not tamper with or attempt any unauthorized repair to any equipment.
6. Do not start any machinery without first personally making certain that no one can be injured by the operation.
7. Never move any piece of equipment without first checking completely around it to see that it is safe to do so.
8. Keep out of areas that are barricaded or marked restricted. There may be work going on or conditions that expose you to danger.
9. Practice lifting properly. Lift with your legs, not your back. Do not try to lift more than you can handle. Get help if the load is too heavy or awkward to handle safely.
10. If you are in doubt about the safe or proper way to do any job, get instructions from your foreman.
11. Any condition which you feel is unsafe should be reported to your foreman or other responsible person.
12. Riding on loads, hooks, buckets, hammers, or material hoists is prohibited.
13. Do not enter any confined space until the area has been cleared by a supervisor or safety officer. Confined spaces may include, but are not limited to, sewers, sumps, manholes and trenches.
14. Getting on or off any vehicle while it is in motion is prohibited.
15. Horseplay is strictly forbidden.
16. Do not use defective handtools. Watch for broken or loose handles and mushroomed heads and report them to your foreman. Always use the right tool for the job.
17. Use the guards provided for all power tools. Do not use any equipment if the guard is broken, inoperative, or missing.
18. Unsafe conditions, acts, or equipment must be promptly corrected and/or reported to your foreman so that corrective action may be taken.
19. Report all accidents and injuries to the supervisor or project manager. Even minor injuries requiring only on-site first aid must be reported.
20. Use good judgment; do not take unnecessary chances.

APPENDIX C:

STANDARD OPERATING PROCEDURES FOR PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

I. STANDARD OPERATING PROCEDURES FOR PERSONAL PROTECTIVE CLOTHING

Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and its frequency of use. The different levels of inspection are as follows:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use or training and prior to maintenance.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The primary inspection of PPE in use for activities at the Site will occur prior to immediate use and will be conducted by the user. This ensures that the user has checked out the specific device or article, and that the user is familiar with its use.

SAMPLE PPE INSPECTION CHECKLISTS

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  1. imperfect seams
  2. non-uniform coatings
  3. tears
  4. malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product
  1. observe for cracks
  2. observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  1. discoloration
  2. swelling
  3. stiffness

- During the work task, periodically inspect for:
  1. Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible defects.
  2. Closure failure
  3. Tears
  4. Punctures
  5. Seam Discontinuities

GLOVES

Before use:

- Visually inspect for:
  1. imperfect seams
  2. tears, abrasions
  3. non-uniform coating
  4. pressurize glove with air, listen for pinhole leaks.

II. STANDARD OPERATING PROCEDURES FOR RESPIRATORY PROTECTION DEVICES

The following subsections define standard operating procedures for air purifying respirators and self-contained breathing apparatus.

A. Cleaning and Disinfecting Self Contained Breathing Apparatus

Cleaning procedures for Self Contained Breathing Apparatus (SCBA) facepieces are identical to those for Ultratwin APRs. The backpiece is cleaned with cleaning solution and a brush. Following cleaning, the facepiece is combined with the regulator and an operational check is performed.

B. SCBA Inspection and Checkout

Monthly Inspection:

1. Check cylinder label for current hydrostatic test date.
2. Inspect cylinder for large dents or gouges.
3. Inspect cylinder gauge for damage.
4. Complete routine inspection.
5. Fill out the appropriate records with results and recommendations.

Routine Inspection (Perform immediately prior to donning or after cleaning):

- Before proceeding, check that the:
  1. High-pressure hose connector is tight on cylinder fitting.
- Backpack and harness assembly:
  1. Visually inspect straps for wear, damage, and completeness.
  2. Check wear and function of belt
  3. Check backplate and cylinder holder for damage.
- Cylinder and high pressure hose assembly:
  1. Check cylinder to assure that it is firmly attached to backplate.
  2. Open cylinder valve; listen or feel for leakage around packing and hose connection.
  3. Check high pressure hose for damage or leaks.
- Regulator:
  1. Cover regulator outlet with palm of hand.
  2. Open mainline valve.
  3. Note stoppage of air flow after positive pressure builds.
  4. Close mainline valve.
  5. Remove hand from regulator outlet.
  6. Open by-pass valve slowly to assure proper function.

7. Close by-pass valve.
8. Open mainline valve.
9. Note pressure reading on regulator gauge.
10. Close cylinder valve while keeping hand over regulator outlet.
11. Slowly remove hand from outlet and allow air to flow.
12. Note pressure when low-pressure warning alarm sounds; it should be between 550-650 psi.
13. Remove hand from regulator outlet.
14. Close mainline valve.
15. Check regulator for leaks by blowing air into regulator for 5-10 seconds. Draw air from outlet for 5-10 seconds. If a positive pressure or vacuum cannot be maintained there is a leak. DO NOT USE SCBA.

- Facepiece and corrugated breathing hose:
  1. Inspect hand harness and facepiece for damage, serrations, and deteriorated rubber.
  2. Inspect lens for damage and proper seal in facepiece. Inspect exhalation valve for damage and dirt build-up.
  3. Stretch breathing hose and carefully inspect for holes and deterioration.
  4. Inspect connector for damage and presence of washer.
  5. Perform negative pressure test with facepiece donned.
  6. Tightly connect high pressure hose to cylinder.
  7. Bleed pressure from high pressure hose by opening mainline valve.
  8. Close by-pass valve.
  9. Close mainline valve.
  10. Fully extend all straps.
  11. Store facepiece in a clean plastic bag for protection.

Limno-Tech, Inc.
Excellence in Environmental Solutions Since 1975

Memorandum

DATE: April 24, 2002~~April 23, 2002~~

PROJECT: **PDXWAC-1**

TO: **Cathryn Young**
Wacker Siltronic Corporation

FROM: **Scott Bell, P.E., DEE**
Robert Betz, CHMM
Joyce Dunkin, CPG
Kathi Futornick

CC:

SUBJECT: **Summary Report: Results of the Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon, March 19-22, 2002**

This memo summarizes the results of soil and groundwater sampling conducted by Limno-Tech, Inc, (LTI) on behalf of Wacker Siltronic Corporation (Wacker Siltronic) on March 19 through 22, 2002 at the Wacker Siltronic facility at 7200 Front Street in Portland, Oregon. LTI sampled soil and groundwater at three locations (GP02-01, GP02-02 and GP02-03) were sampled for in accordance with the March 2002 Workplan submitted to the Oregon Department of Environmental Quality (ODEQ). Sampling locations are depicted on Figure 1 (attached). The objective of the sampling described in this memo was "to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the reported 1984 trichloroethene (TCE) spill at Wacker Siltronic" (LTI, 2002).

SUMMARY OF SAMPLING ACTIVITIES AND RESULTS

Three soil samples and three groundwater samples were collected from each of the three sampling locations in this investigation. Trichloroethene and/or its breakdown products (1,1-dichloroethene, cis-1,2-dichloroethene, vinyl chloride) were detected at all three sampling locations. These chlorinated volatile organic compounds (CVOCs) were detected in both soil and groundwater at two locations (GP02-01 and GP02-02), but only in groundwater at location GP02-03. In almost all samples where CVOCs were detected, petroleum-related volatile organic compounds (PVOCs) were also detected. PVOCs have been detected in soils and groundwater on the Northwest Natural (former Gasco) site located northwest of and adjacent to the Wacker site.

Most Significant Finding

The highest concentrations of CVOCs were detected in samples from the GP02-02 boring, located approximately 50 feet northwest of GP02-01 (the reported 1984 trichloroethene spill area) and between the reported trichloroethene spill area and the Northwest Natural site. At GP02-02, the highest CVOC concentrations were detected in the groundwater sample collected from a depth of 96' to 100' below ground surface. This

sample contained TCE at a concentration of 575 mg/L, which is indicative of the nearby presence of non-aqueous phase liquid (NAPL) TCE. This is of particular concern, because if NAPL TCE is present it will act as a continuing source of groundwater contamination.

Attainment of Objectives

The objective of the sampling described in this memo was "to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the reported 1984 trichloroethene (TCE) spill at Wacker Siltronic" (LTI, 2002). However, although the data collected during this sampling event verify the presence of CVOCs in soil and groundwater, the source of the detected chemical impacts cannot be determined from the available data. The data do not eliminate the possibility that the impacts are a result of the 1984 Wacker TCE release, but they do not eliminate the possibility that they are the result of historical waste disposal practices from the Gasco facility, either. The latter is a possibility because the highest detected concentrations were collocated with the former lowland area into which Gasco disposed of process wastes. A tar-contaminated soil layer was encountered at a depth of 20' to 25' below grade in two borings, which corroborates this collocation.

Source of CVOC Impacts

The nature of the CVOC impacts in soil and groundwater indicate that they are the likely result of a TCE release, because the detected chemicals are TCE and common break-down products of TCE, including 1,2-dichloroethene and vinyl chloride. While these chemicals may occur from the breakdown of tetrachloroethene (PCE), PCE is not the likely source because no residual PCE was detected. Furthermore, the concentration of TCE detected in the deepest groundwater sample from location GP02-02 was high enough to indicate the potential presence of residual NAPL TCE, which would not likely occur if PCE was the source material. However, as mentioned above, the source of the TCE cannot be determined with certainty as TCE has been in common use as an industrial solvent since the 1940s and was used for various applications even before that (Doherty, 2000).

Relation of Detected CVOC Impacts to P-2

Finally, the results of this investigation are inconclusive with respect to the source(s) of CVOCs detected in groundwater at the P-2 location, which was conducted during the August 2001 Focused Remedial Investigation of the Wacker site conducted by Northwest Natural as a component of ongoing work related to investigations of the former Gasco site. However, it should be noted that there are apparent inconsistencies between the analytical results obtained in this investigation and the results previously obtained at boring P-2, located along the riverbank. For example, trans-1,2-dichloroethene (t-1,2-DCE) was detected at P-2 but not at GP02-01, GP02-02, or GP02-03. The presence of t-1,2-DCE may indicate that the impacts at P-2 are from a different source than those detected in this investigation. More importantly, TCE was detected at 96' to 100' below

ground surface at both P-2 and GP02-02, but TCE was not detected at that depth in sample location GP02-03, which is located between GP02-02 and P-2. If the TCE and other CVOCs detected at P-2 came from the TCE detected at GP02-02, one would expect there would be measurable concentrations of these compounds at GP02-03, but neither TCE nor its daughter products was detected there. While this is not conclusive, it does suggest that the CVOC impacts at P-2 did not migrate from the southwest side of the Wacker building, where the 1984 TCE release was reported.

SUMMARY DESCRIPTION OF SAMPLING ACTIVITIES

The three borings were installed using a geoprobe devise to depths of 100 feet below surface level. Sampling was conducted as follows to characterize sediment types:

- GP02-01: Continuous sampling was conducted down to 29.5 ft below grade using a 5-ft sampler, then, continuous sampling was conducted down to 38 ft below grade using a 2 ft sampler. Thereafter, sampling was conducted every 10 feet with a 2 ft sampler (starting with the 48 to 50 ft sample) down to 100 ft below grade.

- GP02-02: Continuous sampling was conducted down to 27 ft below grade using a 5-ft sampler. Thereafter, sampling was conducted every 10 feet with a 2 ft sampler (starting with the 38 to 40 ft sample) down to 100 ft below grade.

- GP02-03: Continuous sampling was conducted down to 60 ft below grade using a 5-ft sampler. Thereafter, sampling was conducted every 10 feet with a 5 ft sampler down to 100 ft below grade, starting with the 65-70 ft sample.

A tar zone was encountered between 22 and 24 ft below grade in borings GP02-01 and GP02-02. The tar zone was situated above a plastic silt/clay layer in both borings. To protect against the possibility of cross-contamination from the tar zone to sediments below the silt/clay layer, a 4-inch diameter outer casing was installed in these two borings down to 28 feet below grade (within the silt/clay layer) before soil sampling was continued below the silt/clay layer. Once the protective outer casing was installed, the 5-ft sampler could not fit through the casing, so a smaller diameter 2-ft sampler was used to finish sampling for sediment characterization. A tar zone was not encountered in GP02-03, therefore, a protective outer casing was not used during the installation and sampling of GP02-03.

Figure 2 is a generalized depiction of the sediments encountered in the three March 2002 borings and at the P-2 location. The P-2 geoprobe boring was installed, logged and sampled by Hahn and Associates, Inc. in August 2001 as part of the Focused Remedial Investigation of the Wacker Siltronics Site, conducted by Northwest Natural. This figure illustrates the presence of an apparently indigenous silt/clay confining layer at depths of 24.5 to 32 feet below grade at the site. The silt/clay layer ranges in thickness from approximately 2 feet to nine feet at the four locations, and separates overlying non-indigenous (fill) material from the underlying indigenous dark gray to black silty fine

sands and silts. Rootlets were found throughout the silt/clay layer and were aligned vertically. Rust colored staining was observed in the silt/clay surrounding some of the rootlets, but no tar was observed in association with the rootlets.

The fill material above the silt/clay layer at the GP02-02 and GP02-03 locations consists primarily of orange and brown clayey, silty fine to medium grained sand interlayered with gray sandy silt zones. The sand was identified by Northwest Natural's representative (Rob Ede of Hahn and Associates, Inc.) as dredge sand originating from the Willamette River. The fill material at the GP02-01 is different in that it primarily consists of gray interbedded loamy sands and silts.

Tar was encountered in sand just above 24 feet below grade at GP02-01 and just above 22 feet below grade at GP02-02. Tar also may be present below the silt/clay confining layer at the GP02-02 location because tar was observed on the drilling rods at 33 to 34 feet when they were pulled from the ground; however, sediment description information was not collected between 27 feet and 38 feet below grade in GP02-02 to confirm this.

A total of three soil and three groundwater samples were collected from each of the three boring locations during this investigation. In addition, quality control (QC) sampling included one soil duplicate sample, one groundwater duplicate sample, and eight blank samples to evaluate conditions associated with equipment cleaning (3 rinse blanks), sample shipping (3 trip blanks), and background conditions (1 filter blank and 1 still blank at the GP02-01 location to assess possible volatilization impacts from the former TCE recycling structure and 1 filter blank to assess contribution of metals from this device during groundwater sample filtration). The samples were submitted to Environmental Services Laboratory, Inc. in Tualatin, Oregon for analysis of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbon compounds (PAHs), 16 metals, and cyanide. Attachment A presents summary tables of the analytical results for soil, groundwater and quality control samples. The samples collected and analyzed at each boring location are summarized in Table 1.

SOIL SAMPLING RESULTS

Soil sample results for detected VOCs, PAHs, metals and cyanide are summarized in Table 2.

Volatile Organic Compounds (VOCs) in Soil Samples

The VOCs were detected in soils at all three boring locations. The only location where VOCs were not detected was GP02-03 at 3-5 feet below ground surface (bgs). The VOCs detected (using USEPA method 8260B) include:

- Two chlorinated solvent-related VOC compounds (CVOCs) – cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE); and

- Thirteen petroleum-related volatile organic compounds (P-VOCs) – benzene, ethylbenzene, toluene, o-xylene, m,p-xylenes, naphthalene, isopropylbenzene, n-butylbenzene, n-propylbenzene, 2-chlorotoluene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene.

The two VOCs detected in soils that represent the chlorinated solvents group (TCE and c-1,2-DCE) were detected in six samples from two boring locations. TCE was detected only at one boring location, GP02-02 at 18-20 feet bgs (1,970 ug/Kg) and at 20-21.5 feet bgs (16.4 ug/Kg); while c-1,2-DCE was detected at two boring locations, GP02-01 at 3-5 feet bgs (8.35 ug/Kg) and GP02-02 at 2-4 feet bgs (42.2 ug/Kg), at 18-20 feet bgs (64.4 ug/Kg), and at 20-21.5 feet bgs (41.1 ug/Kg). At the soil sample locations where CVOCs were detected, P-VOCs and PAHs were also detected. This may indicate that the CVOCs, PVOCs and PAHs are the result of a common source. As can be seen in Table 2, TCE in GP02-02 18-20 feet bgs is the only detected CVOC that exceeds the lowest value for the state and federal groundwater screening criteria.

The P-VOCs were detected in eight samples from all three boring locations. Naphthalene was the most frequently detected of this compound group, being present in eight of the 10 soil samples. Naphthalene was not detected in GP02-01 3-5 feet bgs and GP02-03 3-5 feet bgs. The greatest number of detected P-VOCs, and also the highest concentrations, occurred in the two samples collected from the subsurface zone where tar was observed. These samples were GP02-01 23-24 feet bgs (13 of 13 detected P-VOCs with concentrations ranging from 1,420 ug/Kg to 3,140,000 ug/Kg) and GP02-02 21.5-23 feet bgs (8 of 13 detected P-VOCs with concentrations ranging from 1,440 ug/Kg to 468,000 ug/Kg). The highest concentrations in these two samples were both attributable to naphthalene. As can be seen in Table 2, benzene and naphthalene at the two samples from the tarry zone (GP02-01 23-24 feet bgs and GP02-02 21.5-23 feet bgs) are the only detected P-VOCs that exceed the lowest value for the state and federal groundwater screening criteria.

Polycyclic Aromatic Hydrocarbon Compounds (PAHs) in Soil Samples

PAHs were detected in soils at increasing concentrations with depth below surface grade at all three boring locations. The only sample where PAHs were not detected was GP02-01 at 3-5 feet below ground surface (bgs). All 16 PAHs targeted by the analytical method (USEPA method 8270SIM) were detected including acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fuoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene. Note that naphthalene is detected by both the analytical methods for PAHs and for VOCs. In general, the VOC analytical method appears to report naphthalene at levels approximately 10 times higher than the PAH analytical method. The two samples with the highest reported PAH concentrations were collected from the subsurface zone where tar was observed. These samples were GP02-01 23-24 feet bgs (all 16 PAHs detected with concentrations ranging from 5,000 ug/Kg to 433,000 ug/Kg) and GP02-02 21.5-23 feet bgs (all 16 PAHs detected with concentrations ranging from 410 ug/Kg to 34,200 ug/Kg). The highest concentrations in these two samples were both attributable to naphthalene. No chlorinated solvents were detected in sample fractions from these two locations that were submitted for VOC analysis. As can be seen in Table 2, PAHs that exceed the lowest value for the state and federal groundwater screening criteria include benzo(a)pyrene and chrysene in all detected samples, and benzo(a)anthracene, benzo(b)fuoranthene, benzo(k)fuoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene at some or most of the locations where detected.

Metals and Cyanide in Soil Samples

Metals were detected in all soil samples analyzed. The metals detected included antimony, arsenic, barium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, titanium, vanadium and zinc. Iron had the highest reported concentrations (ranging up to 32,300 mg/Kg). Antimony had the lowest reported concentrations (ranging from 1.05 to 1.31 mg/Kg) and, detected in three of the 10 samples analyzed, was the only metal not detected in all samples. As can be seen in Table 2, arsenic and iron exceed the lowest value for the state and federal groundwater screening criteria in all or almost all samples where detected; while lead, nickel and zinc concentrations exceed the lowest criteria value at two or three locations, each.

Cyanide was detected in seven of the 10 soil samples analyzed at concentrations ranging from (0.102 to 16.4 mg/Kg). The highest concentration was associated with the GP02-01 23-23 feet bgs sample. This sample was collected from the tar layer observed at the site. As can be seen in Table 2, only cyanide results for the GP02-01 23-24 feet bgs sample (from the tar zone) exceed the lowest value for the state and federal groundwater screening criteria.

GROUNDWATER SAMPLE RESULTS

Groundwater sample results for detected VOCs, PAHs, metals and cyanide are summarized in Table 3.

Volatile Organic Compounds (VOCs) in Groundwater Samples

The VOCs were detected in seven of the 10 groundwater samples collected from the three boring locations. Groundwater samples with no VOCs were detected include GP02-01 at 56-60 feet bgs, GP02-01 at 96-100 feet bgs and GP02-03 at 96-100 feet bgs.The highest VOC concentrations were observed in samples from the GP02-02 boring location. VOCs detected in groundwater samples (using USEPA method 8260B) included:

- Four chlorinated solvent-related VOC compounds (CVOCs) – 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE), vinyl chloride (VC);

- Seven petroleum-related compounds (P-VOCs) – benzene, ethylbenzene, toluene, o-xylene, m,p-xylenes, naphthalene, 1,2,4-trimethylbenzene; and

- Dichlorodifluoromethane.

The four CVOCs detected in groundwater (TCE, c-1,2-DCE, 1,1-DCE and VC) were detected in six samples from the three boring locations. TCE was detected in four samples at two boring locations, GP02-02 at 56-60 feet bgs (21,000 ug/L), GP02-02 at 96-100 feet bgs (575,000 ug/L), GP02-03 at 31-35 feet bgs (4.29 ug/L) and at GP02-03 at 56-60 feet bgs (33.4 ug/L). c-1,2-DCE was detected in six samples at the three boring locations, GP02-01 at 34-38 feet bgs (85.3 ug/L), GP02-01 at 56-60 feet bgs (88.9 ug/L), GP02-02 at 23-27 feet bgs (21,500 ug/L), GP02-02 at 56-60 feet bgs (57,900 ug/L), GP02-02 at 96-100 feet bgs (975 ug/L) and at GP02-03 at 56-60 feet bgs (101 ug/L). 1,1-DCE was only detected in one sample, GP02-02 at 96-100 feet bgs (171 ug/L). VC was detected in four samples at two boring locations, GP02-01 at 34-38 feet bgs (duplicate results of 2.01 ug/L and 2.3 ug/L) and GP02-02 at 96-100 feet bgs (25.4 ug/L), and GP02-03 at 96-100 feet bgs (204 ug/L). At the groundwater sample locations where CVOCs were detected, P-VOCs and/or PAHs were also detected. This may indicate that the CVOCs, P-VOCs, and PAHs are the result of a common source. As can be seen in Table 3, all detected CVOCs exceed the lowest value for the state and federal groundwater screening criteria.

The seven P-VOCs were detected in six groundwater samples from all three boring locations. Benzene and naphthalene were the most frequently detected P-VOCs in groundwater, being present in six and three, respectively, of the 10 groundwater samples analyzed. Naphthalene was only detected in the three GP02-02 groundwater samples, while benzene was detected in samples from every boring location. Benzene and naphthalene also had the highest concentrations of the P-VOC group, with maximum

reported concentrations of 4,970 ug/L and 9,200 ug/L, respectively, both from the GP02-02 23-27 feet bgs sample. In every sample that benzene was detected, c-1,2-DCE was also detected. As can be seen in Table 3, benzene and naphthalene (at all locations detected) are the only detected P-VOCs that exceed the lowest value for the state and federal groundwater screening criteria.

Polycyclic Aromatic Hydrocarbon Compounds (PAHs) in Groundwater Samples

Eleven PAHs were detected in groundwater samples including acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene. PAHs were detected in six of the 10 groundwater samples from two boring locations. No PAHs were detected in samples collected from the GP02-01 boring location. However, a laboratory error resulted in using the incorrect method of analysis for all four samples from GP02-01 and also for the sample GP02-02 23-27 feet bgs. The detection limits for the incorrect method (2 ug/L for USEPA method 8270C) were 20 times higher than the detection limits for the requested method (0.1 ug/L for USEPA method 8270SIM). As a result, it is possible that PAHs are present in the GP02-01 groundwater samples at levels below the 2 ug/L detection limit. The sample with the greatest number of detected PAHs (10 of 16) is GP02-02 23-27 feet bgs. This sample was collected from the zone were tar was observed. It should be pointed out that the soils at this location were not observed to be saturated at the time of soil sampling; however, water was present at this depth at the time of groundwater sampling. As can be seen in Table 3, PAHs that exceed the lowest value for the state and federal groundwater screening criteria include benzo(a)anthracene, benzo(a)pyrene, and chrysene at GP02-02 23-27 feet bgs, and naphthalene at GP02-02 56-60 feet bgs and GP02-02 96-100 feet bgs.

Metals and Cyanide in Groundwater Samples

Metals were detected in all groundwater samples analyzed. The metals detected included arsenic, barium, cobalt, iron, lead, magnesium, manganese, nickel, selenium and zinc. Iron generally had the highest reported concentrations (ranging up to 99 mg/L). Arsenic had the lowest reported concentrations (ranging from 0.0066 mg/L to 0.0095 mg/L) and was detected in six of the 10 samples analyzed. In general, concentrations for each metal were essentially uniform among all sample results, the reported values not showing much fluctuation. As can be seen in Table 3, arsenic, iron and manganese concentrations exceed the lowest value for the state and federal groundwater screening criteria.

Cyanide was detected in seven of the 10 groundwater samples analyzed at concentrations ranging from (0.276 mg/L to 4.85 mg/L). The highest concentration was associated with the GP02-01 34-38 feet bgs duplicate sample. As can be seen in Table 3, all detected cyanide results exceed the lowest value for the state and federal groundwater screening criteria.

REFERENCES

Doherty, Richard E. (2000). "A History of the Use of Carbon Tetrachloride, Tetrachloroethylene, Trichloroethylene and 1,1,1-Trichloroethane in the United States: Part 2 – Trichloroethylene and 1,1,1-Trichloroethane." *Journal of Environmental Forensics*. v1 n2 pp83-93. June 2000.

Limno-Tech, Inc. (LTI, 2002). Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon, submitted via March 6, 2002 letter to Mr. Eric Blischke (ODEQ) from Kathi Futornick (LTI), as amended by March 15, 2002 letter from Eric Blischke (ODEQ) to Cathryn Young (Wacker).

ATTACHMENT A:

Figures and Tables

Limno-Tech, Inc.
Excellence in Environmental Solutions Since 1975

April 30, 2002

Eric Blischke, Project Manager
Voluntary Cleanup and Portland Harbor Section
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987

RE: Summary of the Remedial Investigation Activities from the *Supplemental Remedial Investigation at Wacker Siltronic Corporation Property*, 7200 NW Front Avenue, Portland, Oregon, March 19-22, 2002

Dear Mr. Blischke,

This transmittal summarizes the activities and results of soil and groundwater sampling conducted by Limno-Tech, Inc, (LTI) on behalf of Wacker Siltronic Corporation (Wacker) on March 19th through 22nd, 2002 at the Wacker facility at 7200 Front Avenue in Portland, Oregon. The field activities were conducted in accordance with the *Workplan for Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon*, submitted via a March 6, 2002 letter to you from LTI, as amended by your March 15, 2002 letter to Cathryn Young (Wacker).[1]

LTI sampled soil and groundwater at three locations (GP02-01, GP02-02 and GP02-03). Sampling locations are depicted on Figure 1 (see Attachment A). The objective of the sampling described in this memo was "to collect data to determine whether unacceptable environmental impacts remain in soil or groundwater from the reported 1984 trichloroethene (TCE) spill at Wacker Siltronic" (LTI, 2002). Based on the results presented herein, it appears that more work will be necessary to fully understand subsurface environmental conditions at the site. We are in the process of evaluating the data and will present our conclusions and recommendations for future work in a subsequent submittal.

[1] (LTI, 2002). Workplan for *Supplemental Remedial Investigation at Wacker Siltronic Corporation Property, Portland, Oregon*, submitted via March 6, 2002 letter to Mr. Eric Blischke (ODEQ) from Kathi Futornick (LTI), as amended by March 15, 2002 letter from Eric Blischke (ODEQ) to Cathryn Young (Wacker).

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DESCRIPTION OF SAMPLING ACTIVITIES

The three borings were installed using a geoprobe device to depths of 100 feet below surface level. Sampling was conducted as follows to characterize sediment types:

- GP02-01: Continuous sampling was conducted down to 29.5 feet below grade using a 5-ft sampler, then, continuous sampling was conducted down to 38 feet below grade using a 2-ft sampler. Thereafter, sampling was conducted every 10 feet with a 2-ft sampler (starting with the 48 to 50 feet sample) down to 100 feet below grade.

- GP02-02: Continuous sampling was conducted down to 27 feet below grade using a 5-ft sampler. Thereafter, sampling was conducted every 10 feet with a 2-ft sampler (starting with the 38 to 40 feet sample) down to 100 feet below grade.

- GP02-03: Continuous sampling was conducted down to 60 feet below grade using a 5-ft sampler. Thereafter, sampling was conducted every 10 feet with a 5-ft sampler down to 100 feet below grade, starting with the 65-70 feet sample.

A tar zone was encountered between 22 and 24 feet below grade in borings GP02-01 and GP02-02. The tar zone was situated above a plastic silt/clay layer in both borings. To protect against the possibility of cross-contamination from the tar zone to sediments below the silt/clay layer, a 4-inch diameter outer casing was installed in these two borings down to 28 feet below grade (within the silt/clay layer) before soil sampling was continued below the silt/clay layer. Once the protective outer casing was installed, the 5-ft sampler could not fit through the casing, so a smaller diameter 2-ft sampler was used to finish sampling for sediment characterization. A tar zone was not encountered in GP02-03, therefore, a protective outer casing was not used during the installation and sampling of GP02-03.

Soil boring logs for the three March 2002 borings are presented in Attachment B. The P-2 geoprobe boring was installed, logged and sampled by Hahn and Associates, Inc. in August 2001 as part of the Focused Remedial Investigation of the Wacker Siltronics Site, conducted by NW Natural. This figure illustrates the presence of an apparently indigenous silt/clay confining layer at depths of 24.5 to 32 feet below grade at the site. The silt/clay layer ranges in thickness from approximately two feet to nine feet at the four locations, and separates overlying non-indigenous (fill) material from the underlying indigenous dark gray to black silty fine sands and silts. Rootlets were found throughout the silt/clay layer and were aligned vertically. Rust colored staining was observed in the silt/clay surrounding some of the rootlets, but no tar was observed in association with the rootlets.

The fill material above the silt/clay layer at the GP02-02 and GP02-03 locations consists primarily of orange and brown clayey, silty fine to medium grained sand interlayered with gray sandy silt zones. The sand was identified by NW Natural's representative

(Rob Ede of Hahn and Associates, Inc.) as dredge sand originating from the Willamette River. The fill material at the GP02-01 is different in that it primarily consists of gray interbedded loamy sands and silts.

At GP02-02 tar was encountered in sand just above 24 feet below grade at GP02-01 and just above 22 feet below grade. Tar also may be present below the silt/clay confining layer at the GP02-02 location because tar was observed on the drilling rods at 33 to 34 feet when they were pulled from the ground; however, sediment description information was not collected between 27 feet and 38 feet below grade in GP02-02 to confirm this.

SUMMARY OF SAMPLING RESULTS

All sampling results from this investigation are summarized in Attachment C. Three soil samples and three groundwater samples were collected from each of the three sampling locations in this investigation. Trichloroethene and/or its breakdown products (1,1-dichloroethene, cis-1,2-dichloroethene, vinyl chloride) were detected at all three sampling locations. These chlorinated volatile organic compounds (CVOCs) were detected in both soil and groundwater at two locations (GP02-01 and GP02-02), but only in groundwater at location GP02-03.

The highest concentrations of CVOCs were detected in samples from the GP02-02 boring. At GP02-02, the highest CVOC concentrations were detected in the groundwater sample collected from a depth of 96 to 100 feet below ground surface (bgs). This sample contained TCE at a concentration of 575 mg/L.

A total of three soil and three groundwater samples were collected from each of the three boring locations during this investigation. In addition, quality control (QC) sampling included one soil duplicate sample, one groundwater duplicate sample, and eight blank samples to evaluate conditions associated with equipment cleaning (3 rinse blanks), sample shipping (3 trip blanks), and background conditions (1 filter blank and 1 still blank at the GP02-01 location to assess possible volatilization impacts from the former TCE recycling structure and 1 filter blank to assess contribution of metals from this device during groundwater sample filtration). The samples were submitted to Environmental Services Laboratory, Inc. (ESL) in Tualatin, Oregon for analysis of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbon compounds (PAHs), 16 metals, and cyanide.

Soil Sample Results

Soil sample results for detected VOCs, PAHs, metals and cyanide are summarized in Attachment C.

Volatile Organic Compounds (VOCs) in Soil Samples

The VOCs were detected in soils at all three boring locations. The only location where VOCs were not detected was GP02-03 at 3-5 feet bgs. The VOCs detected (using USEPA method 8260B) include:

- Two chlorinated solvent-related VOC compounds (CVOCs) – cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE); and

- Thirteen petroleum-related volatile organic compounds (P-VOCs) – benzene, ethylbenzene, toluene, o-xylene, m,p-xylenes, naphthalene, isopropylbenzene, n-butylbenzene, n-propylbenzene, 2-chlorotoluene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene.

The two VOCs detected in soils that represent the chlorinated solvents group (TCE and c-1,2-DCE) were detected in six samples from two boring locations. TCE was detected only at one boring location, GP02-02 at 18-20 feet bgs (1,970 ug/Kg) and at 20-21.5 feet bgs (16.4 ug/Kg); while c-1,2-DCE was detected at two boring locations, GP02-01 at 3-5 feet bgs (8.35 ug/Kg) and GP02-02 at 2-4 feet bgs (42.2 ug/Kg), at 18-20 feet bgs (64.4 ug/Kg), and at 20-21.5 feet bgs (41.1 ug/Kg). At the soil sample locations where CVOCs were detected, P-VOCs and PAHs were also detected. TCE in GP02-02 18-20 feet bgs is the only detected CVOC that exceeds the lowest value for the state and federal groundwater screening criteria.

The P-VOCs were detected in eight samples from all three boring locations. Naphthalene was the most frequently detected of this compound group, being present in eight of the ten soil samples. Naphthalene was not detected in GP02-01 3-5 feet bgs and GP02-03 3-5 feet bgs. The greatest number of detected P-VOCs, and also the highest concentrations, occurred in the two samples collected from the subsurface zone where tar was observed. These samples were GP02-01 23-24 feet bgs (13 of 13 detected P-VOCs with concentrations ranging from 1,420 ug/Kg to 3,140,000 ug/Kg) and GP02-02 21.5-23 feet bgs (8 of 13 detected P-VOCs with concentrations ranging from 1,440 ug/Kg to 468,000 ug/Kg). The highest concentrations in these two samples were both attributable to naphthalene. Benzene and naphthalene, two samples from the tarry zone (GP02-01 23-24 feet bgs and GP02-02 21.5-23 feet bgs), are the only detected P-VOCs that exceed the lowest value for the state and federal groundwater screening criteria.

Polycyclic Aromatic Hydrocarbon Compounds (PAHs) in Soil Samples

PAHs were detected in soils at increasing concentrations with depth below surface grade at all three boring locations. The only sample where PAHs were not detected was GP02-01 at 3-5 feet bgs. All 16 PAHs targeted by the analytical method (USEPA method 8270SIM) were detected including acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fuoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene. Note that naphthalene is detected by both the analytical methods for PAHs and for VOCs. In general, the VOC

analytical method appears to report naphthalene at levels approximately 10 times higher than the PAH analytical method. The two samples with the highest reported PAH concentrations were collected from the subsurface zone where tar was observed. These samples were GP02-01 23-24 feet bgs (all 16 PAHs detected with concentrations ranging from 5,000 ug/Kg to 433,000 ug/Kg) and GP02-02 21.5-23 feet bgs (all 16 PAHs detected with concentrations ranging from 410 ug/Kg to 34,200 ug/Kg). The highest concentrations in these two samples were both attributable to naphthalene. No chlorinated solvents were detected in sample fractions from these two locations that were submitted for VOC analysis. PAHs that exceed the lowest value for the state and federal groundwater screening criteria include benzo(a)pyrene and chrysene in all detected samples, and benzo(a)anthracene, benzo(b)fuoranthene, benzo(k)fuoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene at some or most of the locations where detected.

Metals and Cyanide in Soil Samples

Metals were detected in all soil samples analyzed. The metals detected included antimony, arsenic, barium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, titanium, vanadium and zinc. Iron had the highest reported concentrations (ranging up to 32,300 mg/Kg). Antimony had the lowest reported concentrations (ranging from 1.05 to 1.31 mg/Kg) and, detected in three of the ten samples analyzed, was the only metal not detected in all samples. Arsenic and iron exceed the lowest value for the state and federal groundwater screening criteria in all or almost all samples where detected; while lead, nickel and zinc concentrations exceed the lowest criteria value at two or three locations, each.

Cyanide was detected in seven of the ten soil samples analyzed at concentrations ranging from (0.102 to 16.4 mg/Kg). The highest concentration was associated with the GP02-01 23-23 feet bgs sample. This sample was collected from the tar layer observed at the site. Only cyanide results for the GP02-01 23-24 feet bgs sample (from the tar zone) exceed the lowest value for the state and federal groundwater screening criteria.

Groundwater Sample Results

Groundwater sample results for detected VOCs, PAHs, metals and cyanide are summarized in Attachment C.

Volatile Organic Compounds (VOCs) in Groundwater Samples

The VOCs were detected in seven of the ten groundwater samples collected from the three boring locations. Groundwater samples with no VOCs were detected include GP02-01 at 56-60 feet bgs, GP02-01 at 96-100 feet bgs and GP02-03 at 96-100 feet bgs. The highest VOC concentrations were observed in samples from the GP02-02 boring location. VOCs detected in groundwater samples (using USEPA method 8260B) included:

- Four chlorinated solvent-related VOC compounds (CVOCs) – 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (c-1,2-DCE), trichloroethene (TCE), vinyl chloride (VC);

- Seven petroleum-related compounds (P-VOCs) – benzene, ethylbenzene, toluene, o-xylene, m,p-xylenes, naphthalene, 1,2,4-trimethylbenzene; and

- Dichlorodifluoromethane.

The four CVOCs detected in groundwater (TCE, c-1,2-DCE, 1,1-DCE and VC) were detected in six samples from the three boring locations. TCE was detected in four samples at two boring locations, GP02-02 at 56-60 feet bgs (21,000 ug/L), GP02-02 at 96-100 feet bgs (575,000 ug/L), GP02-03 at 31-35 feet bgs (4.29 ug/L) and at GP02-03 at 56-60 feet bgs (33.4 ug/L). c-1,2-DCE was detected in six samples at the three boring locations, GP02-01 at 34-38 feet bgs (85.3 ug/L), GP02-01 at 56-60 feet bgs (88.9 ug/L), GP02-02 at 23-27 feet bgs (21,500 ug/L), GP02-02 at 56-60 feet bgs (57,900 ug/L), GP02-02 at 96-100 feet bgs (975 ug/L) and at GP02-03 at 56-60 feet bgs (101 ug/L). 1,1-DCE was only detected in one sample, GP02-02 at 96-100 feet bgs (171 ug/L). VC was detected in four samples at two boring locations, GP02-01 at 34-38 feet bgs (duplicate results of 2.01 ug/L and 2.3 ug/L) and GP02-02 at 96-100 feet bgs (25.4 ug/L), and GP02-03 at 96-100 feet bgs (204 ug/L). At the groundwater sample locations where CVOCs were detected, P-VOCs and/or PAHs were also detected. This may indicate that the CVOCs, P-VOCs, and PAHs are the result of a common source. All detected CVOCs exceed the lowest value for the state and federal groundwater screening criteria.

The seven P-VOCs were detected in six groundwater samples from all three boring locations. Benzene and naphthalene were the most frequently detected P-VOCs in groundwater, being present in six and three, respectively, of the ten groundwater samples analyzed. Naphthalene was only detected in the three GP02-02 groundwater samples, while benzene was detected in samples from every boring location. Benzene and naphthalene also had the highest concentrations of the P-VOC group, with maximum reported concentrations of 4,970 ug/L and 9,200 ug/L, respectively, both from the GP02-02 23-27 feet bgs sample. In every sample that benzene was detected, c-1,2-DCE was also detected. Benzene and naphthalene (at all locations detected) are the only detected P-VOCs that exceed the lowest value for the state and federal groundwater screening criteria.

Polycyclic Aromatic Hydrocarbon Compounds (PAHs) in Groundwater Samples

Eleven PAHs were detected in groundwater samples including acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene. PAHs were detected in six of the ten groundwater samples from two boring locations. No PAHs were detected in samples collected from the GP02-01 boring location. However, a laboratory error resulted in using the incorrect method of analysis for all four samples from GP02-01 and also for the sample GP02-02 23-27 feet bgs. The detection limits for the incorrect method (2 ug/L for USEPA method 8270C) were 20 times higher than the detection limits for the requested

method (0.1 ug/L for USEPA method 8270SIM). As a result, it is possible that PAHs are present in the GP02-01 groundwater samples at levels below the 2 ug/L detection limit. The sample with the greatest number of detected PAHs (10 of 16) is GP02-02 23-27 feet bgs. This sample was collected from the zone where tar was observed. It should be pointed out that the soils at this location were not observed to be saturated at the time of soil sampling; however, water was present at this depth at the time of groundwater sampling. PAHs that exceed the lowest value for the state and federal groundwater screening criteria include benzo(a)anthracene, benzo(a)pyrene, and chrysene at GP02-02 23-27 feet bgs, and naphthalene at GP02-02 56-60 feet bgs and GP02-02 96-100 feet bgs.

Metals and Cyanide in Groundwater Samples

Metals were detected in all groundwater samples analyzed. The metals detected included arsenic, barium, cobalt, iron, lead, magnesium, manganese, nickel, selenium and zinc. Iron generally had the highest reported concentrations (ranging up to 99 mg/L). Arsenic had the lowest reported concentrations (ranging from 0.0066 mg/L to 0.0095 mg/L) and was detected in six of the ten samples analyzed. In general, concentrations for each metal were essentially uniform among all sample results, the reported values not showing much fluctuation. Arsenic, iron and manganese concentrations exceed the lowest value for the state and federal groundwater screening criteria.

Cyanide was detected in seven of the ten groundwater samples analyzed at concentrations ranging from (0.276 mg/L to 4.85 mg/L). The highest concentration was associated with the GP02-01 34-38 feet bgs duplicate sample. All detected cyanide results exceed the lowest value for the state and federal groundwater screening criteria.

If you have any questions, please call me at (503) 248-1768.

Sincerely,

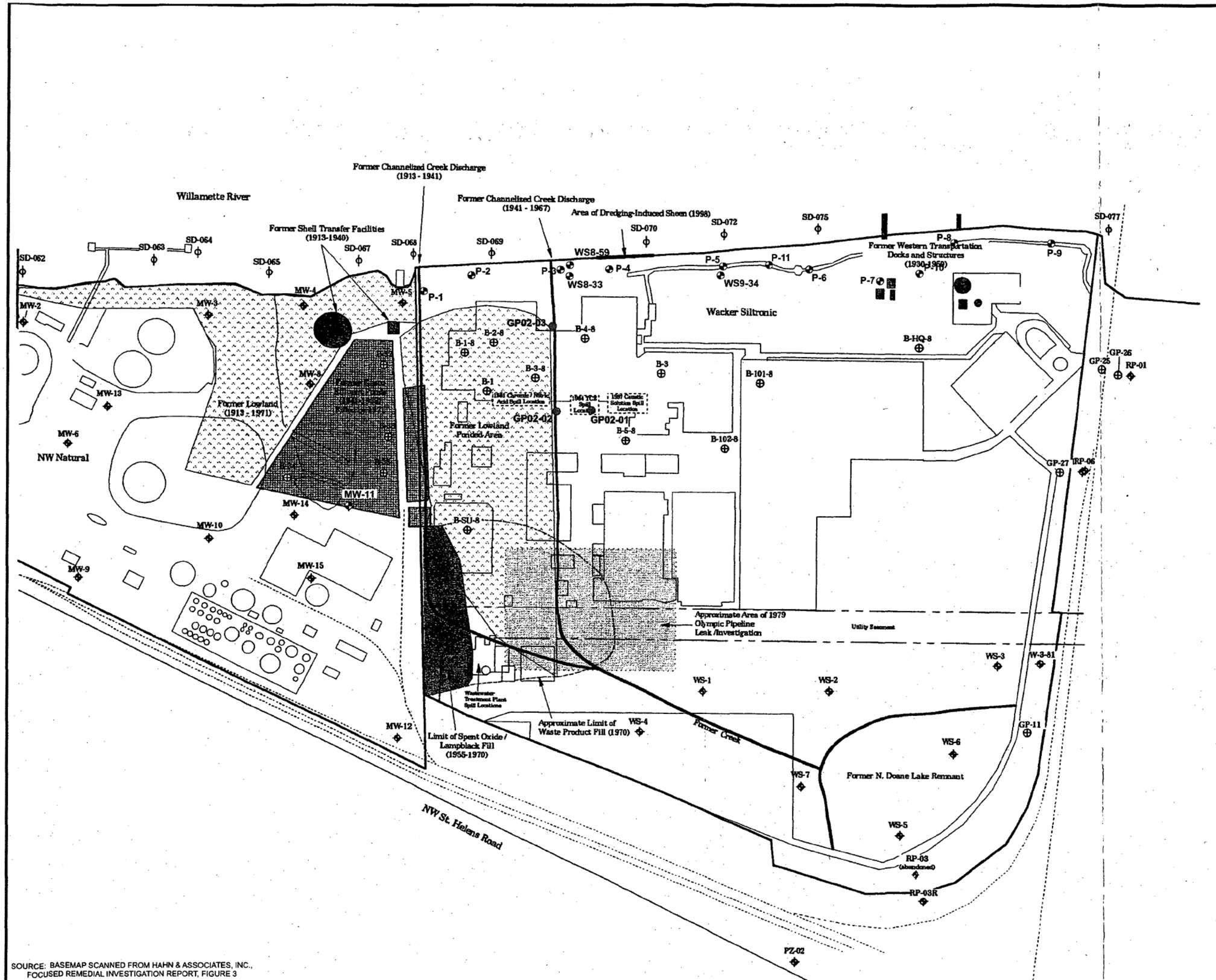
Kathi Futornick

Kathi Futornick
Northwest Regional Manager

Attachments

cc: Cathryn Young / Wacker Siltronic Corporation
Bob Wyatt / NW Natural

ATTACHMENT A: BORING LOCATIONS



SOURCE: BASEMAP SCANNED FROM HAHN & ASSOCIATES, INC., FOCUSED REMEDIAL INVESTIGATION REPORT, FIGURE 3

FIGURE 1. SOIL AND GROUNDWATER SAMPLING LOCATIONS

LTI Environmental Engineering
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ATTACHMENT B: SOIL BORING LOGS

LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0–3	48"/60"	Soil Sample (3' to 5')	Moist	SP		Gray fill SAND (36")	
3–5				SM		Dark gray fine sandy SILT (12")	
5–9	60"/60"		Moist	SP		Gray loamy fine SAND (48")	
9–10				SP		Dark gray fine to medium SAND (12")	
10–11	42"/60"	Soil Sample (11' to 14')	Moist	ML		Dark gray SILT (6")	
				SP		Fine to medium SAND (3")	
				ML		Gray SILT (5")	
11–13				SP		Gray to dark gray (stained) loamy medium sand (24")	
13–14				SP		Dark brown loamy medium SAND (4")	
14–15						No Recovery	
15–18	36"/60"		Moist	ML		Gray plastic SILT (6")	
				SM		Fine to medium brown silty SAND (7")	
				ML		Plastic SILT (3")	
				SP		Brown silty fine to medium SAND (3")	
				SP		Gray to black fine to medium SAND with some gravel (17")	
18–20						No Recovery	
20–23	54"/60"	Soil Sample (23' to 24')		ML		Dark gray plastic SILT (6")	
				SP		Dark gray fine to medium SAND with some gravel, silt and wood (24")	
				ML		Dark gray plasic SILT (4")	
23–25				SP		Fine SAND, tar above silt (18")	
				ML		Stiff dark gray SILT (2")	

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04-30-2002

LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
25							
26	24"/24"			ML		Plastic dark gray/olive SILT (odor) (24")	
27				ML		Plastic gray SILT with orange staining (12")	
28	30"/36"		Moist	ML		Protective casing set at 28'	
29							
30							
31	24"/24"		Moist	ML		Plastic medium brown clayey SILT with orange staining (24")	
32							
33	24"/24"		Moist	CL-ML		Plastic medium brown clayey SILT with orange staining (18")	
34				SP		Gray very fine silty SAND (12")	▽
35	18"/24"		Moist	ML-SP		Dark gray silty very fine to fine SAND (no odor) (12")	
36		Water Sample (35'-38')				No Recovery	
37	0"/24"						
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48				SP		Dark olive/gray silty fine SAND (6")	
49	24"/24"		Wet	ML		Stiff dark olive/gray sandy SILT (6")	
				SP		Medium dense dark olive/gray silty fine SAND (12")	
50							

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04-30-2002

LTI Environmental Engineering
A Division of Limno-tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
50							
51							
52							
53							
54							
55							
56							
57							
58				SP		Very dark gray silty fine SAND (3")	
59	14"/24"		Wet	ML		Stiff very dark gray very fine sandy SILT (11")	
60						No Recovery	
61							
62							
63							
64							
65							
66							
67							
68				SP		Loose dark olive/gray fine SAND, some silt, some medium sand (3")	
69	3"/24"		Wet			No Recovery	
70							
71							
72							
73							
74							
75							

04-30-2002 j:\hazwaste\pdxwac\soilbo~1\gp02-01.bor

LTI Environmental Engineering
A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-01

Wacker Siltronic Corporation

Date Started	: 3/19/02	Total Depth	: 100'
Date Completed	: 3/19/02	Depth to water	: 34.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
75							
76							
77							
78				SP		Loose dark olive/gray fine SAND (12")	
79	18"/24"		Wet	SP		Medium dense dark olive/gray silty fine SAND (1")	
80						Very dense dark olive/gray silty fine SAND (6")	
						No Recovery	
81							
82							
83							
84							
85							
86							
87							
88				SP		Very loose dark gray fine SAND, some silt (6")	
89	18"/24"		Wet	ML-SP		Dark gray fine to medium silty SAND (12")	
90						No Recovery	
91							
92							
93							
94							
95							
96							
97							
98				SP-ML			
				ML-SP		Dark gray fine SAND, some silt (2")	
99	22"/24"		Wet	SP-ML		Plastic dark gray SILT, some sand (6")	
						Dark gray fine SAND, some silt (14")	
100						End Of Boring	

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A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0						Asphalt (5")	
1				ML		Stiff dark gray SILT, rootlets, friable (30")	
2	42"/60"	Soil Sample (2' to 4')	Dry				
3				SP		Loose orange and brown layered loamy fine to medium SAND, some silt (11")	
4				ML		SILT (1")	
5						No Recovery	
6				SP		Loose orange and brown layered, loamy, fine to medium SAND (24")	
7	30"/60"		Dry	ML		Plastic dark olive/gray clayey SILT (5")	
8				SP		Loose orange and brown layered loamy fine to medium SAND (1")	
9						No Recovery	
10				SP		Orange/brown loamy fine to medium SAND. Silt lenses present in upper 5". (39")	
11							
12	39"60"		Dry				
13						No Recovery	
14							
15				SP		Orange/brown loamy fine to medium SAND with 3" zone of plastic clayey silt and wood (12")	
16		Soil Sample (18' to 20')		SP		Orange/brown loamy fine to medium SAND (21")	
17	39"/60"		Dry to 18'				
18				ML		Dark gray plastic SILT (6")	
19			Moist			No Recovery	
20		Soil Sample (20.5' to 23')	Dry	SP		Orange/brown fine to medium SAND with 1" - 2" zone of dark sheen/odor. (9")	▽
21			Moist	SP		Orange/brown fine to medium SAND with black tar, sheen and odor (6")	
22	35"/60"			ML		Very plastic olive brown clayey SILT (12")	
23				ML		Plastic olive/brown clayey SILT with roots and wood (8")	
24						No Recovery	
25							

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A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
25							
26	24"/24"	Water Sample (23' to 27')	Moist	ML		Very plastic olive brown clayey SILT, odor (24")	
27						No Recovery	
28						Protective casing set to 28'	
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39	18"/24"		Wet	SP		Loose, uniform, olive/brown silty fine SAND with vertical rootlets and rust staining (18")	
40						No Recovery	
41							
42							
43							
44							
45							
46							
47							
48							
49	16"/24"		Wet	SP		Loose, uniform, dark gray fine silty SAND (13")	
				ML		Dark gray fine sandy SILT (3")	
50							

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501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
50							
51							
52							
53							
54							
55							
56							
57							
58		Water Sample (56' to 60')		SP		Loose, uniform, dark gray silty SAND (6")	
59	12"/24"		Wet	ML		Stiff, dark gray sandy SILT (6")	
60						No Recovery	
61							
62							
63							
64							
65							
66							
67							
68				ML		Dark gray fine sandy SILT (5")	
69	24"/24"		Wet	SP		Loose dark gray very fine to fine SAND (16")	
70				ML		Stiff dark gray sandy SILT (3")	
71							
72							
73							
74							
75							

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A Division of Limno-Tech, Inc.
501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-02

Wacker Siltronic Corporation

Date Started	: 3/20/02	Total Depth	: 100'
Date Completed	: 3/20/02	Depth to water	: 20.5'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
75							
76							
77							
78				SP		Loose dark gray silty very fine to fine SAND (10")	
79	10"/24"		Moist			No Recovery	
80							
81							
82							
83							
84							
85							
86							
87							
88				SP		Loose dark gray fine SAND some silt (14")	
89	20"/24"		Wet	ML		Dark gray very fine sandy SILT (6")	
90						No Recovery	
91							
92							
93							
94							
95							
96							
97							
98				SP		Loose dark gray fine SAND some silt (14")	
99	20"/24"		Wet	ML		Stiff dark gray very fine sandy SILT (6")	
100							

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
0				FL		Gravel and sand FILL (14")	
1				SP		Dense silty fine SAND and stiff sandy silt (12")	
2	54"/60"		Dry	SP		Loose orange/brown loamy fine to medium SAND (10")	
3				ML		Brown sandy SILT (6")	
4		Soil Sample (3' to 5')		SP		Loose orange/brown loamy fine to medium SAND (12")	
5						No Recovery	
				SP		Orange/brown fine to medium silty SAND (1")	
6						Loose orange/brown loamy fine to medium SAND (56")	
7	57"/60"		Dry	SP			
8							
9							
10						No Recovery	
				SP		Loose orange/brown loamy fine to medium SAND (12")	
11				SP		Gravel (1")	
12	42"/60"		Dry	SP		Loose orange/brown loamy fine to medium SAND with layers of dark organic woody material/cinders at bottom (29")	
13							
14						No Recovery	
15							
16				SP		Loose orange/brown loamy fine to medium SAND (31")	
17	36"/60"		Dry to Moist				
18				ML		Black very dense very fine SAND and stiff silt with layer of barklike material at top and layer of gravel in middle (5")	
19	48"/60"		Dry to Moist			No Recovery	
20							

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
20			Moist	SP			
21				ML		Brown sandy SILT (6")	
				GP		Loose, friable white GRAVEL (4")	
22	48"/60"		Dry to Moist	GP		Dry white gravel with brown stiff silt and SAND (4")	
				ML		Very stiff black sandy SILT (8")	
23				SP		Black fine to medium SAND with silt lenses and red brick (5")	
				ML			
				SP			
24				ML		Moist stiff black SILT (3")	
		Soil Sample (22' to 24')				Black fine to medium SAND (5")	
		Soil Sample (24' to 26')				Black SILT (1")	
25			Moist	ML		No Recovery	
26			Wet	SP		Stiff dark gray sandy SILT (7")	▽
						Orange/brown fine to medium SAND (13")	
27				SP		Dark gray fine SAND (16")	
	60"/60"						
28				ML		Plastic dark gray SILT with rootlets (24")	
29							
30						No Recovery	
31							
32	0"/60"		Wet				
33		Water Sample (31' to 35')					
34							
35				ML		Cohesive, soft brown sandy SILT with rust colored spots (3")	
				SP			
				ML			
36				SP		Brown silty fine to medium SAND (2")	
				ML		Cohesive, soft brown sandy SILT with rust colored spots (4")	
37	24"/60"					Brown silty fine to medium SAND (6")	
38						Cohesive, soft brown sandy SILT with rust colored spots (9")	
39						No Recovery	
40							

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
40							
41							
42	54"/60"		Wet	SP			
43							
44							
				ML		Medium stiff rusty brown sandy SILT/silty sand (4")	
45						No Recovery	
46				ML		Dark olive gray fine sandy SILT (18")	
				SP		Medium loose dark olive gray silty fine SAND (3")	
47	60"/60"		Wet	ML		Dark olive gray fine sandy SILT with wood frag. at 47' (14")	
48				SP			
				ML		Dark olive gray silty fine SAND (2")	
				SP		Dark olive gray fine sandy SILT (3")	
49						Dark olive gray silty fine SAND (14")	
				ML		Firm plastic dark olive gray SILT (6")	
50				SP		Dark olive gray fine to medium silty SAND (4")	
51				ML		Firm, plastic dark olive gray SILT, some sand (10")	
52	54"/60"		Wet	SP		Dark olive gray silty fine SAND, trace medium sand (40")	
53							
54							
55						No Recovery	
				SP		Dark olive gray silty fine SAND (2")	
56				ML		Firm plastic dark olive gray SILT, some sand and layers of woody material (18")	
57	60"/60"		Wet	SP		Dark olive gray silty fine SAND (40")	
58		Water Sample (56' to 60')					
59							
60							

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501 Avis Drive, Ann Arbor, MI 48108

LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
60							
61							
62							
63							
64							
65							
66				SP		Dark olive gray silty fine SAND (30")	
67	54"/60"		Wet				
68				SP		Dark olive gray silty fine SAND with two stiffer silt lenses (24")	
69							
70						No Recovery	
71							
72							
73							
74							
75							
76						Dark olive gray silty fine SAND (60")	
77	60"/60"		Wet	SP			
78							
79							
80							

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LOG OF BORING GP02-03

Wacker Siltronic Corporation

Date Started	: 3/21/02	Total Depth	: 100'
Date Completed	: 3/21/02	Depth to water	: 26'
Drilling Method	: Geoprobe		
Drilling Contractor	:		
Logged By	: JSD		

Depth in Feet	Recovery (in.)	Sample Type	Moisture Content	USCS	GRAPHIC	DESCRIPTION	Water Levels
80							
81							
82							
83							
84							
85				ML		Very firm dark olive gray fine sandy SILT (12")	
86				ML		Very firm dark olive gray sandy SILT (5")	
87	59"/60"		Wet	SP		Very firm dark olive gray silty fine SAND (15")	
88				ML		Very firm dark olive gray sandy SILT (5")	
				SP		Very firm dark olive gray silty fine SAND (10")	
89				ML		Plastic dark olive gray SILT, some sand (12")	
90				SP		Very firm dark olive gray silty fine SAND (1")	
91							
92							
93							
94							
95				ML		Dark olive gray fine sandy SILT (9")	
96		Water Sample (96' to 100')		SP		Dark olive gray silty fine SAND (45")	
97	54"/60"		Wet				
98							
99							
100						End of Boring	

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ATTACHMENT C: ANALYTICAL DATA

Soil Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	GP02-01			GP02-01			GP02-01			GP02-02			GP02-02			Duplicate (GP02-02)			GP02-02			GP02-03			GP02-03			GP02-03		
Sample Depth (feet):	3-5			11-14			23-24			2-4			18-20			21-23			23-25			3-5			22-24			24-26		
Date Collected:	3/19/2002			3/19/2002			3/19/2002			3/20/2002			3/20/2002			3/20/2002			3/20/2002			3/21/2002			3/21/2002			3/21/2002		
Lab ID:	0203188-01A			0203188-02A			0203188-03A			0203193-10A			0203193-11A			0203193-13A			0203193-12A			0203212-01A			0203212-03A			0203212-02A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
CYANIDE (mg/Kg)	Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002 DF=10		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002 DF=5		Date Analyzed:	3/26/2002 DF=5	
Cyanide	ND	0.08		0.34	0.08		16.4	0.8		0.102	0.08		0.342	0.08		ND	0.08		1.84	0.08		ND	0.08		7.03	0.4		5.62	0.4	
METALS (mg/Kg)	Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:	3/27/2002		Date Analyzed:	3/27/2002		Date Analyzed:	3/27/2002	
Antimony	ND	1		ND	1		ND	1		1.05	1		ND	1		ND	1		ND	1		1.07	1		1.31	1		ND	1	
Arsenic	1.83	1		2.33	1		2.12	1		3.92	1		2.42	1		2.22	1		2.77	1		3.12	1		4.33	1		2.39	1	
Barium	112	1		80.4	1		72.3	1		117	1		92.3	1		64.9	1		118	1		71.4	1		112	1		91.7	1	
Chromium	22.3	1		13.3	1		13	1		23.8	1		13.5	1		12.3	1		20.5	1		11.9	1		19.5	1		15.7	1	
Cobalt	13	1		13.5	1		9.47	1		14	1		13.1	1		12.6	1		11.4	1		13	1		12.9	1		12.1	1	
Copper	21.9	1		13.5	1		13.1	1		31.5	1		14.2	1		12.3	1		18.2	1		13.4	1		20	1		14.5	1	
Iron	25,200	4		24,200	4		18,700	2		30,400	4		32,300	4		22600	4		29,200	4		23,800	4		29,800	4		24,100	4	
Lead	9.87	1		4.72	1		35.2	1		17.5	1		4.12	1		3.55	1		2.45	1		1.64	1		21.4	1		4.48	1	
Magnesium	4,330	10		2,820	10		2,450	10		4,130	10		3,020	10		2900	10		3,290	10		3,010	10		3,400	10		3,090	10	
Manganese	316	1		287	1		197	1		568	1		290	1		230	1		150	1		253	1		363	1		215	1	
Nickel	18.3	1		12.8	1		15.5	1		17.9	1		14.6	1		13.6	1		27.4	1		14.5	1		16.1	1		36.2	1	
Selenium	ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1	
Silver	ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1		ND	1	
Titanium	1,490	1		1,740	1		1,130	1		1,300	1		1,580	1		1480	1		1,450	1		1,590	1		1,740	1		1,320	1	
Vanadium	68.5	1		72.1	1		66.1	1		73.9	1		69	1		62	1		74	1		66	1		81.7	1		129	1	
Zinc	80.8	1		52.9	1		39	1		128	1		52.4	1		41.4	1		40.8	1		43	1		106	1		44.3	1	
PAHs (ug/Kg)	Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002 DF=1000		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002		Date Analyzed:	3/25/2002	
Acenaphthene	ND	50		1,000	50		30,000	50,000		ND	50		ND	50		ND	50		3,050	50		ND	50		165	50		385	50	
Acenaphthylene	ND	50		925	50		45,000	50,000		ND	50		50	50		75	50		3,750	50		65	50		120	50		225	50	
Anthracene	ND	50		2,100	50		50,000	50,000		ND	50		75	50		175	50		4,450	50		110	50		265	50		705	50	
Benzo(a)anthracene	ND	50		2,600	50		26,000	50,000		80	50		275	50		220	50		3,480	50		280	50		530	50		3,100	50	
Benzo(a)pyrene	ND	50		2,980	50		26,000	50,000		75	50		440	50		285	50		3,290	50		435	50		750	50		4,070	50	
Benzo(b)fluoranthene	ND	50		1,760	50		13,000	50,000		55	50		235	50		140	50		1,840	50		265	50		505	50		2,450	50	
Benzo(g,h,i)perylene	ND	50		2,290	50		18,000	50,000		65	50		405	50		245	50		2,360	50		445	50		725	50		3,500	50	
Benzo(k)fluoranthene	ND	50		1,700	50		18,000	50,000		60	50		270	50		190	50		1,880	50		260	50		440	50		2,420	50	
Chrysene	ND	50		3,540	50		40,000	50,000		110	50		395	50		310	50		4,440	50		485	50		865	50		4,440	50	
Dibenzo(a,h)anthracene	ND	50		335	50		5,000	50,000		ND	50		70	50		ND	50		410	50		75	50		125	50		650	50	
Fluoranthene	ND	50		5,500	50		100,000	50,000		160	50		675	50		665	50		8,850	50		640	50		1,270	50		4,450	50	
Fluorene	ND	50		1,360	50		44,000	50,000		ND	50		ND	50		65	50		4,000	50		ND	50		70	50		325	50	
Indeno(1,2,3-cd)pyrene	ND	50		1,600	50		13,000	50,000		55	50		285	50		170	50		1,740	50		305	50		505	50		2,560	50	
Naphthalene	ND	50		355	50		433,000	50,000		110	50		ND	50		55	50		34,200	50		ND	50		70	50		385	50	
Phenanthrene	ND	50		6,200	50		233,000	50,000		95	50		160	50		735	50		21,000	50		70	50		645	50		3,300	50	
Pyrene	ND	50		7,100	50		112,000	50,000		150	50		690	50		625	50		10,800	50		630	50		1,900	50		5,450	50	
VOLATILE ORGANICS (ug/Kg)	Date Analyzed:	3/28/2002		Date Analyzed:	3/28/2002 DF=20		Date Analyzed:	3/28/2002 DF=200		Date Analyzed:	3/28/2002 DF=2		Date Analyzed:	3/29/2002 DF=4		Date Analyzed:	3/29/2002		Date Analyzed:	3/29/2002 DF=200		Date Analyzed:	3/29/2002		Date Analyzed:	3/29/2002		Date Analyzed:	3/29/2002	
1,1,1,2-Tetrachloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1,1-Trichloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1,2,2-Tetrachloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1,2-Trichloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1-Dichloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1-Dichloroethene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,1,-Dichloropropene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2,3-Trichlorobenzene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2,3-Trichloropropane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2,4-Trichlorobenzene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2,4-Trimethylbenzene	ND	5		ND	100		43,100	1,000		ND	10		ND	20		ND	5		6,380	1,000		ND	5		ND	5		ND	5	
1,2-Dibromo-3-chloropropane	ND	10		ND	200		ND	2,000		ND	20		ND	40		ND	10		ND	2,000		ND	10		ND	10		ND	10	
1,2-Dibromoethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2-Dichlorobenzene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2-Dichloroethane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,2-Dichloropropane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,3,5-Trimethylbenzene	ND	5		ND	100		13,700	1,000		ND	10		ND	20		ND	5		1,850	1,000		ND	5		ND	5		ND	5	
1,3-Dichlorobenzene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,3-Dichloropropane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
1,4-Dichlorobenzene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
2,2-Dichloropropane	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
2-Butanone	ND	100		ND	2,000		ND	20,000		ND	200		ND	400		ND	100		ND	20,000		ND	100		ND	100		ND	100	
2-Chloroethyl vinyl ether	ND	50		ND	1,000		ND	10,000		ND	100		ND	200		ND	50		ND	10,000		ND	50		ND	50		ND	50	
2-Chlorotoluene	ND	5		ND	100		2,930	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
2-Hexanone	ND	100		ND	2,000		ND	20,000		ND	200		ND	400		ND	100		ND	20,000		ND	100		ND	100		ND	100	
4-Chlorotoluene	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
4-Isopropyltoluene	ND	5		ND	100		3,480	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	
4-Methyl-2-pentanone	ND	5		ND	100		ND	1,000		ND	10		ND	20		ND	5		ND	1,000		ND	5		ND	5		ND	5	

(continued on the next page)

Soil Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	GP02-01			GP02-01			GP02-01			GP02-02		
Sample Depth (feet):	3-5			11-14			23-24			2-4		
Date Collected:	3/19/2002			3/19/2002			3/19/2002			3/20/2002		
Lab ID:	0203188-01A			0203188-02A			0203188-03A			0203193-10A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
VOLATILE ORGANICS (ug/Kg)	Date Analyzed:	3/28/2002		Date Analyzed:	3/28/2002	DF= 20	Date Analyzed:	3/28/2002	DF=200	Date Analyzed:	3/28/2002	DF=2
Acetone	ND	100		ND	2,000		ND	20,000		ND	200	
Benzene	ND	5		ND	100		42,700	1,000		ND	10	
Bromobenzene	ND	5		ND	100		ND	1,000		ND	10	
Bromochloromethane	ND	5		ND	100		ND	1,000		ND	10	
Bromodichloromethane	ND	5		ND	100		ND	1,000		ND	10	
Bromoform	ND	5		ND	100		ND	1,000		ND	10	
Bromomethane	ND	10		ND	200		ND	2,000		ND	20	
Carbon disulfide	ND	5		ND	100		ND	1,000		ND	10	
Carbon tetrachloride	ND	5		ND	100		ND	1,000		ND	10	
Chlorobenzene	ND	5		ND	100		ND	1,000		ND	10	
Chloroethane	ND	10		ND	200		ND	2,000		ND	20	
Chloroform	ND	5		ND	100		ND	1,000		ND	10	
Chloromethane	ND	10		ND	200		ND	2,000		ND	20	
cis-1,2-Dichloroethene	8.35	5		ND	100		ND	1,000		42.2	10	
cis-1,3-Dichloropropene	ND	5		ND	100		ND	1,000		ND	10	
Dibromochloromethane	ND	5		ND	100		ND	1,000		ND	10	
Dibromomethane	ND	5		ND	100		ND	1,000		ND	10	
Dichlorodifluoromethane	ND	10		ND	200		ND	2,000		ND	20	
Ethylbenzene	ND	5		ND	100		62,400	1,000		ND	10	
Hexachlorobutadiene	ND	5		ND	100		ND	1,000		ND	10	
Iodomethane	ND	5		ND	100		ND	1,000		ND	10	
Isopropylbenzene	ND	5		ND	100		4,670	1,000		ND	10	
m,p-Xylene	ND	10		ND	200		70,700	2,000		ND	20	
Methyl tert-butyl ether	ND	10		ND	200		ND	2,000		ND	20	
Methylene chloride	ND	100		ND	2,000		ND	20,000		ND	200	
n-Butylbenzene	ND	5		ND	100		1,420	1,000		ND	10	
n-Propylbenzene	ND	5		ND	100		2,940	1,000		ND	10	
Naphthalene	ND	10		1,290	200		3,140,000	100,000		64.2	20	
o-Xylene	ND	5		ND	100		33,400	1,000		ND	10	
sec-Butylbenzene	ND	5		ND	100		ND	1,000		ND	10	
Styrene	ND	5		ND	100		ND	1,000		ND	10	
tert-Butylbenzene	ND	5		ND	100		ND	1,000		ND	10	
Tetrachloroethene	ND	5		ND	100		ND	1,000		ND	10	
Toluene	ND	5		ND	100		53,700	1,000		ND	10	
trans-1,2-Dichloroethene	ND	5		ND	100		ND	1,000		ND	10	
trans-1,3-Dichloropropene	ND	5		ND	100		ND	1,000		ND	10	
Trichloroethene	ND	5		ND	100		ND	1,000		ND	10	
Trichlorofluoromethane	ND	10		ND	200		ND	2,000		ND	20	
Vinyl acetate	ND	5		ND	100		ND	1,000		ND	10	
Vinyl chloride	ND	10		ND	200		ND	2,000		ND	20	

Sample ID:	GP02-02			Duplicate (GP02-02)			GP02-02			GP02-03		
Sample Depth (feet):	18-20			21-23			23-25			3-5		
Date Collected:	3/20/2002			3/20/2002			3/20/2002			3/21/2002		
Lab ID:	0203193-11A			0203193-13A			0203193-12A			0203212-01A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
VOLATILE ORGANICS (ug/Kg)	Date Analyzed:	3/29/2002	DF=4	Date Analyzed:	3/29/2002		Date Analyzed:	3/29/2002	DF=200	Date Analyzed:	3/29/2002	
Acetone	ND	400		ND	100		ND	20,000		ND	100	
Benzene	ND	20		ND	5		1,440	1,000		ND	5	
Bromobenzene	ND	20		ND	5		ND	1,000		ND	5	
Bromochloromethane	ND	20		ND	5		ND	1,000		ND	5	
Bromodichloromethane	ND	20		ND	5		ND	1,000		ND	5	
Bromoform	ND	20		ND	5		ND	1,000		ND	5	
Bromomethane	ND	40		ND	10		ND	2,000		ND	10	
Carbon disulfide	ND	20		ND	5		ND	1,000		ND	5	
Carbon tetrachloride	ND	20		ND	5		ND	1,000		ND	5	
Chlorobenzene	ND	20		ND	5		ND	1,000		ND	5	
Chloroethane	ND	40		ND	10		ND	2,000		ND	10	
Chloroform	ND	20		ND	5		ND	1,000		ND	5	
Chloromethane	ND	40		ND	10		ND	2,000		ND	10	
cis-1,2-Dichloroethene	64.4	20		41.1	5		ND	1,000		ND	5	
cis-1,3-Dichloropropene	ND	20		ND	5		ND	1,000		ND	5	
Dibromochloromethane	ND	20		ND	5		ND	1,000		ND	5	
Dibromomethane	ND	20		ND	5		ND	1,000		ND	5	
Dichlorodifluoromethane	ND	40		ND	10		ND	2,000		ND	10	
Ethylbenzene	ND	20		ND	5		4,300	1,000		ND	5	
Hexachlorobutadiene	ND	20		ND	5		ND	1,000		ND	5	
Iodomethane	ND	20		ND	5		ND	1,000		ND	5	
Isopropylbenzene	ND	20		ND	5		ND	1,000		ND	5	
m,p-Xylene	ND	40		ND	10		6,400	2,000		ND	10	
Methyl tert-butyl ether	ND	40		ND	10		ND	2,000		ND	10	
Methylene chloride	ND	400		ND	5		ND	20,000		ND	5	
n-Butylbenzene	ND	20		ND	5		ND	1,000		ND	5	
n-Propylbenzene	ND	20		ND	5		ND	1,000		ND	5	
Naphthalene	428	40		99	10		468,000	40,000		ND	10	
o-Xylene	ND	20		ND	5		3,000	1,000		ND	5	
sec-Butylbenzene	ND	20		ND	5		ND	1,000		ND	5	
Styrene	ND	20		ND	5		ND	1,000		ND	5	
tert-Butylbenzene	ND	20		ND	5		ND	1,000		ND	5	
Tetrachloroethene	ND	20		ND	5		ND	1,000		ND	5	
Toluene	ND	20		ND	5		4,500	1,000		ND	5	
trans-1,2-Dichloroethene	ND	20		ND	5		ND	1,000		ND	5	
trans-1,3-Dichloropropene	ND	20		ND	5		ND	1,000		ND	5	
Trichloroethene	1,970	20		16.4	5		ND	1,000		ND	5	
Trichlorofluoromethane	ND	40		ND	10		ND	2,000		ND	10	
Vinyl acetate	ND	20		ND	5		ND	1,000		ND	5	
Vinyl chloride	ND	40		ND	10		ND	2,000		ND	10	

Sample ID:	GP02-03			GP02-03		
Sample Depth (feet):	22-24			24-26		
Date Collected:	3/21/2002			3/21/2002		
Lab ID:	0203212-03A			0203212-02A		
Analytes	Result	Limit	Qual	Result	Limit	Qual
VOLATILE ORGANICS (ug/Kg)	Date Analyzed:	3/29/2002		Date Analyzed:	3/29/2002	
Acetone	ND	100		ND	100	
Benzene	ND	5		ND	5	
Bromobenzene	ND	5		ND	5	
Bromochloromethane	ND	5		ND	5	
Bromodichloromethane	ND	5		ND	5	
Bromoform	ND	5		ND	5	
Bromomethane	ND	10		ND	10	
Carbon disulfide	ND	5		ND	5	
Carbon tetrachloride	ND	5		ND	5	
Chlorobenzene	ND	5		ND	5	
Chloroethane	ND	10		ND	10	
Chloroform	ND	5		ND	5	
Chloromethane	ND	10		ND	10	
cis-1,2-Dichloroethene	ND	5		ND	5	
cis-1,3-Dichloropropene	ND	5		ND	5	
Dibromochloromethane	ND	5		ND	5	
Dibromomethane	ND	5		ND	5	
Dichlorodifluoromethane	ND	10		ND	10	
Ethylbenzene	ND	5		ND	5	
Hexachlorobutadiene	ND	5		ND	5	
Iodomethane	ND	5		ND	5	
Isopropylbenzene	ND	5		ND	5	
m,p-Xylene	ND	10		ND	10	
Methyl tert-butyl ether	ND	10		ND	10	
Methylene chloride	ND	100		ND	100	
n-Butylbenzene	ND	5		ND	5	
n-Propylbenzene	ND	5		ND	5	
Naphthalene	17.2	10		44.6	10	
o-Xylene	ND	5		ND	5	
sec-Butylbenzene	ND	5		ND	5	
Styrene	ND	5		ND	5	
tert-Butylbenzene	ND	5		ND	5	
Tetrachloroethene	ND	5		ND	5	
Toluene	ND	5		ND	5	
trans-1,2-Dichloroethene	ND	5		ND	5	
trans-1,3-Dichloropropene	ND	5		ND	5	
Trichloroethene	ND	5		ND	5	
Trichlorofluoromethane	ND	10		ND	10	
Vinyl acetate	ND	5		ND	5	
Vinyl chloride	ND	10		ND	10	

Limit = Laboratory reporting limit (practical quantitation limit)
Qual = Laboratory qualifier

Groundwater Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	GP02-01			Duplicate (GP02-01)			GP02-01			GP02-01			GP02-02			GP02-02			GP02-02			GP02-03			GP02-03			GP02-03		
Sample Depth (feet):	34-38			34-38			56-60			96-100			23-27			56-60			96-100			31-35			56-60			96-100		
Date Collected:	3/20/2002			3/20/2002			3/20/2002			3/20/2002			3/20/2002			3/21/2002			3/21/2002			3/21/2002			3/22/2002			3/22/2002		
Lab ID:	0203193-01A			0203193-06A			0203193-02A			0203193-03A			0203193-09A			0203212-04A			0203212-05A			0203212-08A			0203216-01A			0203216-02A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
CYANIDE (mg/L)	Date Analyzed	3/22/2002	DF=5	Date Analyzed	3/22/2002	DF=5	Date Analyzed	3/22/2002		Date Analyzed	3/22/2002		Date Analyzed	3/22/2002	DF=5	Date Analyzed	3/22/2002	DF=2	Date Analyzed	3/22/2002		Date Analyzed	3/22/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002	
Cyanide	4.41	0.2		4.85	0.2		ND	0.04		ND	0.04		4.04	0.2		1.01	0.08		ND	0.04		0.276	0.04		0.498	0.04		0.309	0.04	
METALS (mg/L)	Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002	
Antimony	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Arsenic	0.0095	0.006		0.0066	0.006		0.0075	0.006		0.0075	0.006		ND	0.006		0.0078	0.006		0.0073	0.006		ND	0.006		ND	0.006		ND	0.006	
Barium	0.0973	0.005		0.0983	0.005		0.0601	0.005		0.0447	0.005		0.181	0.005		0.0749	0.005		0.0538	0.005		0.062	0.005		0.06	0.005		0.0871	0.005	
Chromium	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Cobalt	0.0071	0.005		0.0076	0.005		ND	0.005		ND	0.005		0.0456	0.005		ND	0.005		ND	0.005		0.0117	0.005		ND	0.005		ND	0.005	
Copper	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Iron	99	0.01		94.5	0.01		59.1	0.01		48.8	0.01		75.6	0.01		64.2	0.01		47.6	0.01		1.61	0.01		19.8	0.01		47.2	0.01	
Lead	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Magnesium	78.7	0.05		79.2	0.05		32.9	0.05		26.7	0.05		44.9	0.05		73.6	0.05		26.2	0.05		54	0.05		38.2	0.05		35.3	0.05	
Manganese	10.5	0.01		10.4	0.01		4.64	0.005		2.91	0.005		12.4	0.005		12.6	0.01		4.77	0.005		6.53	0.005		2.02	0.005		3.11	0.005	
Nickel	ND	0.005		ND	0.005		0.0077	0.005		ND	0.005		0.0286	0.005		ND	0.005		ND	0.005		0.0125	0.005		0.0069	0.005		ND	0.005	
Selenium	0.0063	0.005		ND	0.005		ND	0.005		ND	0.005		0.0064	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Silver	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Titanium	ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01		ND	0.01	
Vanadium	ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005		ND	0.005	
Zinc	0.0159	0.005		0.0141	0.005		0.0331	0.005		0.0153	0.005		0.0111	0.005		0.0098	0.005		0.0183	0.005		0.0348	0.005		0.0244	0.005		0.0188	0.005	
PAHs (ug/L)	Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/26/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002	
Acenaphthene	ND	2		ND	2		ND	2		ND	2		62.4	2		4.24	0.1		ND	0.1		0.19	0.1		0.62	0.1		ND	0.1	
Acenaphthylene	ND	2		ND	2		ND	2		ND	2		167	2		0.84	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Anthracene	ND	2		ND	2		ND	2		ND	2		20.7	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Benzo(a)anthracene	ND	2		ND	2		ND	2		ND	2		2.71	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Benzo(a)pyrene	ND	2		ND	2		ND	2		ND	2		2.48	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Benzo(b)fluoranthene	ND	2		ND	2		ND	2		ND	2		ND	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Benzo(g,h,i)perylene	ND	2		ND	2		ND	2		ND	2		ND	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Benzo(k)fluoranthene	ND	2		ND	2		ND	2		ND	2		ND	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Chrysene	ND	2		ND	2		ND	2		ND	2		3.63	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Dibenzo(a,h)anthracene	ND	2		ND	2		ND	2		ND	2		ND	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Fluoranthene	ND	2		ND	2		ND	2		ND	2		17.6	2		0.11	0.1		ND	0.1		0.38	0.1		0.15	0.1		0.21	0.1	
Fluorene	ND	2		ND	2		ND	2		ND	2		74.2	2		0.22	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Indeno(1,2,3-cd)pyrene	ND	2		ND	2		ND	2		ND	2		ND	2		ND	0.1		ND	0.1		ND	0.1		ND	0.1		ND	0.1	
Naphthalene	ND	2		ND	2		ND	2		ND	2		ND	2		1,030	0.1		145	0.1		0.94	0.1		0.16	0.1		0.22	0.1	
Phenanthrene	ND	2		ND	2		ND	2		ND	2		139	2		0.2	0.1		0.2	0.1		0.31	0.1		ND	0.1		0.1	0.1	
Pyrene	ND	2		ND	2		ND	2		ND	2		19.6	2		0.11	0.1		ND	0.1		0.49	0.1		0.19	0.1		0.31	0.1	
VOLATILE ORGANICS (ug/L)	Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	4/1/2002	DF=1000	Date Analyzed	3/30/2002	DF=250	Date Analyzed	3/30/2002		Date Analyzed	3/30/2002		Date Analyzed	3/30/2002		Date Analyzed	3/30/2002	
1,1,1,2-Tetrachloroethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,1,1-Trichloroethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,1,2,2-Tetrachloroethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,1,2-Trichloroethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,1-Dichloroethane	ND	1.5		ND	1.5		ND	1.5		ND	1.5		ND	1500		ND	375		ND	1.5		ND	1.5		ND	1.5		ND	1.5	
1,1-Dichloroethene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		171	1	E	ND	1		ND	1		ND	1	
1,1,-Dichloropropene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2,3-Trichlorobenzene	ND	1.8		ND	1.8		ND	1.8		ND	1.8		ND	1800		ND	450		ND	1.8		ND	1.8		ND	1.8		ND	1.8	
1,2,3-Trichloropropane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2,4-Trichlorobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2,4-Trimethylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		2.92	1		ND	1		ND	1		ND	1	
1,2-Dibromo-3-chloropropane	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		ND	2		ND	2		ND	2		ND	2	
1,2-Dibromoethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2-Dichloroethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,2-Dichloropropane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,3,5-Trimethylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,3-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,3-Dichloropropane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
1,4-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
2,2-Dichloropropane	ND	1.9		ND	1.9		ND	1.9		ND	1.9		ND	1900		ND	475		ND	1.9		ND	1.9		ND	1.9		ND	1.9	
2-Butanone	ND	20		ND	20		ND	20		ND	20		ND	1000		ND	5000		ND	20		ND	20		ND	20		ND	20	
2-Chloroethyl vinyl ether	ND	5		ND	5		ND	5		ND	5		ND	1000		ND	1250		ND	5		ND	5		ND	5		ND	5	
2-Chlorotoluene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
2-Hexanone	ND	20		ND	20		ND	20		ND	20		ND	20000		ND	5000		ND	20		ND	20		ND	20		ND	20	
4-Chlorotoluene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
4-Isopropyltoluene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
4-Methyl-2-pentanone	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	

(continued on the next page)

Groundwater Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	GP02-01			Duplicate (GP02-01)			GP02-01			GP02-01			GP02-02			GP02-02			GP02-02			GP02-03			GP02-03			GP02-03		
Sample Depth (feet):	34-38			34-38			56-60			96-100			23-27			56-60			96-100			31-35			56-60			96-100		
Date Collected:	3/20/2002			3/20/2002			3/20/2002			3/20/2002			3/20/2002			3/21/2002			3/21/2002			3/21/2002			3/22/2002			3/22/2002		
Lab ID:	0203193-01A			0203193-06A			0203193-02A			0203193-03A			0203193-09A			0203212-04A			0203212-05A			0203212-08A			0203216-01A			0203216-02A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
VOLATILE ORGANICS (ug/L)	Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	3/27/2002		Date Analyzed	4/1/2002 DF=1000		Date Analyzed	3/30/2002 DF=250		Date Analyzed	3/30/2002		Date Analyzed	3/30/2002		Date Analyzed	3/30/2002		Date Analyzed	3/30/2002	
Acetone	ND	20		ND	20		ND	20		ND	20		ND	20000		ND	5000		ND	20		ND	20		ND	20		ND	20	
Benzene	3.25	1		3.48	1		ND	1		ND	1		4,970	1000		1060	250		122	1		ND	1		2.94	1		ND	1	
Bromobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Bromochloromethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Bromodichloromethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Bromoform	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Bromomethane	ND	5		ND	5		ND	5		ND	5		ND	5000		ND	1250		ND	5		ND	5		ND	5		ND	5	
Carbon disulfide	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Carbon tetrachloride	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Chlorobenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Chloroethane	ND	5		ND	5		ND	5		ND	5		ND	5000		ND	1250		ND	5		ND	5		ND	5		ND	5	
Chloroform	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Chloromethane	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		ND	2		ND	2		ND	2		ND	2	
cis-1,2-Dichloroethene	85.3	1		88.9	1		ND	1		ND	1		21,500	21500		57900	250		975	1	E	ND	1		101	1		ND	1	
cis-1,3-Dichloropropene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Dibromochloromethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Dibromomethane	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Dichlorodifluoromethane	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	250		192	2	E	ND	2		ND	2		ND	2	
Ethylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		47.8	1		ND	1		ND	1		ND	1	
Hexachlorobutadiene	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		ND	2		ND	2		ND	2		ND	2	
Iodomethane	ND	5		ND	5		ND	5		ND	5		ND	5000		ND	1250		ND	5		ND	5		ND	5		ND	5	
Isopropylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
m,p-Xylene	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		31.4	2		ND	2		ND	2		ND	2	
Methyl tert-butyl ether	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		ND	2		ND	2		ND	2		ND	2	
Methylene chloride	ND	20		ND	20		ND	20		ND	20		ND	20000		ND	5000		ND	20		ND	20		ND	20		ND	20	
n-Butylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
n-Propylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Naphthalene	ND	2		ND	2		ND	2		ND	2		9,200	2000		2160	500		302	2	E	ND	2		ND	2		ND	2	
o-Xylene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		19.9	1		ND	1		ND	1		ND	1	
sec-Butylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Styrene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
tert-Butylbenzene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Tetrachloroethene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Toluene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		43.1	1		ND	1		ND	1		ND	1	
trans-1,2-Dichloroethene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
trans-1,3-Dichloropropene	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Trichloroethene	ND	1		ND	1		ND	1		ND	1		ND	1000		21000	250		575000	10000		4.29	1		33.4	1		ND	1	
Trichlorofluoromethane	ND	2		ND	2		ND	2		ND	2		ND	2000		ND	500		ND	2		ND	2		ND	2		ND	2	
Vinyl acetate	ND	1		ND	1		ND	1		ND	1		ND	1000		ND	250		ND	1		ND	1		ND	1		ND	1	
Vinyl chloride	2.01	1.2		2.3	1.2		ND	1.2		ND	1.2		ND	1200		ND	300		25.4	1.2		ND	1.2		204	1.2		ND	1.2	

Limit = Laboratory reporting limit (practical quantitation limit)
Qual = Laboratory qualifier
E = Value above the quantitation limit. It is considered an estimate.

Quality Control Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	Trip Blank			Trip Blank			Trip Blank			Still Blank			Filter Blank			Rinse Blank (Screen)			Rinse Blank (Soil Sampler)			Rinse Blank (Screen)		
Date Collected:	3/20/2002			3/21/2002			3/22/2002			3/20/2002			3/20/2002			3/20/2002			3/21/2002			3/22/2002		
Lab ID:	0203193-05A			0203212-07A			0203216-04A			0203193-08A			0203193-07A			0203193-04A			0203212-06A			0203216-03A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
CYANIDE (mg/L)	Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:	3/22/2002		Date Analyzed:	3/22/2002		Date Analyzed:		
Cyanide																ND	0.04		ND	0.04				
METALS (mg/L)	Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:	3/26/2002		Date Analyzed:	3/26/2002		Date Analyzed:	3/28/2002		Date Analyzed:		
Antimony													ND	0.005		ND	0.005		ND	0.005				
Arsenic													ND	0.006		ND	0.006		ND	0.006				
Barium													ND	0.005		0.006	0.005		ND	0.005				
Chromium													ND	0.005		ND	0.005		ND	0.005				
Cobalt													ND	0.005		ND	0.005		ND	0.005				
Copper													ND	0.005		ND	0.005		ND	0.005				
Iron													0.0748	0.01		0.997	0.01		0.0339	0.01				
Lead													ND	0.005		ND	0.005		ND	0.005				
Magnesium													0.0609	0.05		0.121	0.05		ND	0.05				
Manganese													0.0082	0.005		0.0175	0.005		ND	0.005				
Nickel													ND	0.005		ND	0.005		ND	0.005				
Selenium													ND	0.005		ND	0.005		ND	0.005				
Silver													ND	0.005		ND	0.005		ND	0.005				
Titanium													ND	0.01		0.101	0.01		ND	0.01				
Vanadium													ND	0.005		ND	0.005		ND	0.005				
Zinc													ND	0.005		0.0117	0.005		ND	0.005				
PAHs (ug/L)	Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:			Date Analyzed:	3/26/2002		Date Analyzed:	3/27/2002		Date Analyzed:	3/27/2002	
Acenaphthene																ND	2		ND	0.1		ND	0.1	
Acenaphthylene																ND	2		ND	0.1		ND	0.1	
Anthracene																ND	2		ND	0.1		ND	0.1	
Benzo(a)anthracene																ND	2		ND	0.1		ND	0.1	
Benzo(a)pyrene																ND	2		ND	0.1		ND	0.1	
Benzo(b)fluoranthene																ND	2		ND	0.1		ND	0.1	
Benzo(g,h,i)perylene																ND	2		ND	0.1		ND	0.1	
Benzo(k)fluoranthene																ND	2		ND	0.1		ND	0.1	
Chrysene																ND	2		ND	0.1		ND	0.1	
Dibenzo(a,h)anthracene																ND	2		ND	0.1		ND	0.1	
Fluoranthene																ND	2		ND	0.1		ND	0.1	
Fluorene																ND	2		ND	0.1		ND	0.1	
Indeno(1,2,3-cd)pyrene																ND	2		ND	0.1		ND	0.1	
Naphthalene																ND	2		ND	0.1		ND	0.1	
Phenanthrene																ND	2		ND	0.1		ND	0.1	
Pyrene																ND	2		ND	0.1		ND	0.1	
VOLATILE ORGANICS (ug/L)	Date Analyzed:	3/27/2002		Date Analyzed:	3/30/2002		Date Analyzed:	3/30/2002		Date Analyzed:	4/1/2002		Date Analyzed:			Date Analyzed:	3/27/2002		Date Analyzed:	3/30/2002		Date Analyzed:	3/30/2002	
1,1,1,2-Tetrachloroethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,1,1-Trichloroethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,1,2,2-Tetrachloroethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,1,2-Trichloroethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,1-Dichloroethane	ND	1.5		ND	1.5		ND	1.5		ND	1.5					ND	1.5		ND	1.5		ND	1.5	
1,1-Dichloroethene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,1,-Dichloropropene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2,3-Trichlorobenzene	ND	1.8		ND	1.8		ND	1.8		ND	1.8					ND	1.8		ND	1.8		ND	1.8	
1,2,3-Trichloropropane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2,4-Trichlorobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2,4-Trimethylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2-Dibromo-3-chloropropane	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
1,2-Dibromoethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2-Dichloroethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,2-Dichloropropane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,3,5-Trimethylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,3-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,3-Dichloropropane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
1,4-Dichlorobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
2,2-Dichloropropane	ND	1.9		ND	1.9		ND	1.9		ND	1.9					ND	1.9		ND	1.9		ND	1.9	
2-Butanone	ND	20		ND	20		ND	20		ND	20					ND	20		ND	20		ND	20	
2-Chloroethyl vinyl ether	ND	5		ND	5		ND	5		ND	5					ND	5		ND	5		ND	5	
2-Chlorotoluene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
2-Hexanone	ND	20		ND	20		ND	20		ND	20					ND	20		ND	20		ND	20	
4-Chlorotoluene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
4-Isopropyltoluene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
4-Methyl-2-pentanone	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	

(continued on the next page)

Quality Control Sample
Analytical Results (Environmental Services Laboratory, Inc.)
Wacker Siltronic Site
Portland, Oregon

Sample ID:	Trip Blank			Trip Blank			Trip Blank			Still Blank			Filter Blank			Rinse Blank (Screen)			Rinse Blank (Soil Sampler)			Rinse Blank (Screen)		
Date Collected:	3/20/2002			3/21/2002			3/22/2002			3/20/2002			3/20/2002			3/20/2002			3/21/2002			3/22/2002		
Lab ID:	0203193-05A			0203212-07A			0203216-04A			0203193-08A			0203193-07A			0203193-04A			0203212-06A			0203216-03A		
Analytes	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual	Result	Limit	Qual
VOLATILE ORGANICS (ug/L)	Date Analyzed:	3/27/2002		Date Analyzed:	3/30/2002		Date Analyzed:	3/30/2002		Date Analyzed:	4/1/2002		Date Analyzed:			Date Analyzed:	3/27/2002		Date Analyzed:	3/30/2002		Date Analyzed:	3/30/2002	
Acetone	ND	20		ND	20		ND	20		ND	20					ND	20		ND	20		ND	20	
Benzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Bromobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Bromochloromethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Bromodichloromethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Bromoform	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Bromomethane	ND	5		ND	5		ND	5		ND	5					ND	5		ND	5		ND	5	
Carbon disulfide	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Carbon tetrachloride	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Chlorobenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Chloroethane	ND	5		ND	5		ND	5		ND	5					ND	5		ND	5		ND	5	
Chloroform	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Chloromethane	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
cis-1,2-Dichloroethene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
cis-1,3-Dichloropropene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Dibromochloromethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Dibromomethane	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Dichlorodifluoromethane	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
Ethylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Hexachlorobutadiene	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
Iodomethane	ND	5		ND	5		ND	5		ND	5					ND	5		ND	5		ND	5	
Isopropylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
m,p-Xylene	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
Methyl tert-butyl ether	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
Methylene chloride	ND	20		ND	20		ND	20		ND	20					ND	20		ND	20		ND	20	
n-Butylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
n-Propylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Naphthalene	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
o-Xylene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
sec-Butylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Styrene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
tert-Butylbenzene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Tetrachloroethene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Toluene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
trans-1,2-Dichloroethene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
trans-1,3-Dichloropropene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Trichloroethene	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Trichlorofluoromethane	ND	2		ND	2		ND	2		ND	2					ND	2		ND	2		ND	2	
Vinyl acetate	ND	1		ND	1		ND	1		ND	1					ND	1		ND	1		ND	1	
Vinyl chloride	ND	1.2		ND	1.2		ND	1.2		ND	1.2					ND	1.2		ND	1.2		ND	1.2	

Limit = Laboratory reporting limit (practical quantitation limit)
Qual = Laboratory qualifier

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

April 02, 2002

Robert Betz, CHMM
Limno-Tech, Inc.
4640 SW Macadam Ave
Ste 60
Portland, OR 97201
TEL: (503) 248-1768
FAX (503) 248-1959

RE: PDX WAC/ WACKER SILTRONICS Order No.: 0203188

Dear Robert Betz, CHMM,

Environmental Services Laboratory received 3 samples on 3/20/02 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
- Cyanide (EPA 9010B)
- ICP Metals (EPA 6010B)
- PAH BY SIM, Soil (8270-SIM)
- Volatiles by GC/MS (EPA 8260B)

Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓ Base Sample Report ✓ Method Blank Report ✓ Sample Duplicate Report
✓ Matrix Spike Report ✓ Laboratory Control Spike ✓ Continuing Calibration Verification Report ✓ Initial Calibration Verification Report
If you have any questions regarding these test results, please feel free to call.

Sincerely,

Leslie Rush
Project Manager

Keith Hunter
Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-01A

Client Sample ID: GP02-01(3-5)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	1.83	1.00		mg/Kg	1	3/22/02
Barium	112	1.00		mg/Kg	1	3/22/02
Chromium	22.3	1.00		mg/Kg	1	3/22/02
Cobalt	13.0	1.00		mg/Kg	1	3/22/02
Copper	21.9	1.00		mg/Kg	1	3/22/02
Iron	25,200	4.00		mg/Kg	1	3/22/02
Lead	9.87	1.00		mg/Kg	1	3/22/02
Magnesium	4,330	10.0		mg/Kg	1	3/22/02
Manganese	316	1.00		mg/Kg	1	3/22/02
Nickel	18.3	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,490	1.00		mg/Kg	1	3/22/02
Vanadium	68.5	1.00		mg/Kg	1	3/22/02
Zinc	80.8	1.00		mg/Kg	1	3/22/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

SCOEPA00011635

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-01A

Client Sample ID: GP02-01(3-5)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/28/02
1,1,1-Trichloroethane	ND	5.00		µg/Kg	1	3/28/02
1,1,2,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/28/02
1,1,2-Trichloroethane	ND	5.00		µg/Kg	1	3/28/02
1,1-Dichloroethane	ND	5.00		µg/Kg	1	3/28/02
1,1-Dichloroethene	ND	5.00		µg/Kg	1	3/28/02
1,1-Dichloropropene	ND	5.00		µg/Kg	1	3/28/02
1,2,3-Trichlorobenzene	ND	5.00		µg/Kg	1	3/28/02
1,2,3-Trichloropropane	ND	5.00		µg/Kg	1	3/28/02
1,2,4-Trichlorobenzene	ND	5.00		µg/Kg	1	3/28/02
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	3/28/02
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	3/28/02
1,2-Dibromoethane	ND	5.00		µg/Kg	1	3/28/02
1,2-Dichlorobenzene	ND	5.00		µg/Kg	1	3/28/02
1,2-Dichloroethane	ND	5.00		µg/Kg	1	3/28/02
1,2-Dichloropropane	ND	5.00		µg/Kg	1	3/28/02
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	3/28/02
1,3-Dichlorobenzene	ND	5.00		µg/Kg	1	3/28/02
1,3-Dichloropropane	ND	5.00		µg/Kg	1	3/28/02
1,4-Dichlorobenzene	ND	5.00		µg/Kg	1	3/28/02
2,2-Dichloropropane	ND	5.00		µg/Kg	1	3/28/02
2-Butanone	ND	100		µg/Kg	1	3/28/02
2-Chloroethyl vinyl ether	ND	50.0		µg/Kg	1	3/28/02
2-Chlorotoluene	ND	5.00		µg/Kg	1	3/28/02
2-Hexanone	ND	100		µg/Kg	1	3/28/02
4-Chlorotoluene	ND	5.00		µg/Kg	1	3/28/02
4-Isopropyltoluene	ND	5.00		µg/Kg	1	3/28/02
4-Methyl-2-pentanone	ND	5.00		µg/Kg	1	3/28/02
Acetone	ND	100		µg/Kg	1	3/28/02
Benzene	ND	5.00		µg/Kg	1	3/28/02
Bromobenzene	ND	5.00		µg/Kg	1	3/28/02
Bromochloromethane	ND	5.00		µg/Kg	1	3/28/02
Bromodichloromethane	ND	5.00		µg/Kg	1	3/28/02
Bromoform	ND	5.00		µg/Kg	1	3/28/02
Bromomethane	ND	10.0		µg/Kg	1	3/28/02
Carbon disulfide	ND	5.00		µg/Kg	1	3/28/02
Carbon tetrachloride	ND	5.00		µg/Kg	1	3/28/02
Chlorobenzene	ND	5.00		µg/Kg	1	3/28/02
Chloroethane	ND	10.0		µg/Kg	1	3/28/02
Chloroform	ND	5.00		µg/Kg	1	3/28/02

Qualifiers:
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B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-01A

Client Sample ID: GP02-01(3-5)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	10.0		µg/Kg	1	3/28/02
cis-1,2-Dichloroethene	8.35	5.00		µg/Kg	1	3/28/02
cis-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/28/02
Dibromochloromethane	ND	5.00		µg/Kg	1	3/28/02
Dibromomethane	ND	5.00		µg/Kg	1	3/28/02
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	3/28/02
Ethylbenzene	ND	5.00		µg/Kg	1	3/28/02
Hexachlorobutadiene	ND	5.00		µg/Kg	1	3/28/02
Iodomethane	ND	5.00		µg/Kg	1	3/28/02
Isopropylbenzene	ND	5.00		µg/Kg	1	3/28/02
m,p-Xylene	ND	10.0		µg/Kg	1	3/28/02
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	3/28/02
Methylene chloride	ND	100		µg/Kg	1	3/28/02
n-Butylbenzene	ND	5.00		µg/Kg	1	3/28/02
n-Propylbenzene	ND	5.00		µg/Kg	1	3/28/02
Naphthalene	ND	10.0		µg/Kg	1	3/28/02
o-Xylene	ND	5.00		µg/Kg	1	3/28/02
sec-Butylbenzene	ND	5.00		µg/Kg	1	3/28/02
Styrene	ND	5.00		µg/Kg	1	3/28/02
tert-Butylbenzene	ND	5.00		µg/Kg	1	3/28/02
Tetrachloroethene	ND	5.00		µg/Kg	1	3/28/02
Toluene	ND	5.00		µg/Kg	1	3/28/02
trans-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/28/02
trans-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/28/02
Trichloroethene	ND	5.00		µg/Kg	1	3/28/02
Trichlorofluoromethane	ND	10.0		µg/Kg	1	3/28/02
Vinyl acetate	ND	5.00		µg/Kg	1	3/28/02
Vinyl chloride	ND	10.0		µg/Kg	1	3/28/02
Surr: 4-Bromofluorobenzene	104.4	74-121		%REC	1	3/28/02
Surr: Dibromofluoromethane	107.0	80-120		%REC	1	3/28/02
Surr: Toluene-d8	105.2	81-117		%REC	1	3/28/02

Qualifiers:
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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-01A

Client Sample ID: GP02-01(3-5)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	50.0		µg/Kg	1	3/25/02
Acenaphthylene	ND	50.0		µg/Kg	1	3/25/02
Anthracene	ND	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	ND	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	ND	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	3/25/02
Chrysene	ND	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	3/25/02
Fluoranthene	ND	50.0		µg/Kg	1	3/25/02
Fluorene	ND	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	3/25/02
Naphthalene	ND	50.0		µg/Kg	1	3/25/02
Phenanthrene	ND	50.0		µg/Kg	1	3/25/02
Pyrene	ND	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	114.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	131.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	90.0	23-120		%REC	1	3/25/02

Qualifiers:

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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT:	Limno-Tech, Inc.	**Client Sample ID:**	GP02-01(11-14)
Lab Order:	0203188	**Tag Number:**	
Project:	PDX WAC/ WACKER SILTRONICS	**Collection Date:**	3/19/02
Lab ID:	0203188-02A	**Matrix:**	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	0.340	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	2.33	1.00		mg/Kg	1	3/22/02
Barium	80.4	1.00		mg/Kg	1	3/22/02
Chromium	13.3	1.00		mg/Kg	1	3/22/02
Cobalt	13.5	1.00		mg/Kg	1	3/22/02
Copper	13.5	1.00		mg/Kg	1	3/22/02
Iron	24,200	4.00		mg/Kg	1	3/22/02
Lead	4.72	1.00		mg/Kg	1	3/22/02
Magnesium	2,820	10.0		mg/Kg	1	3/22/02
Manganese	287	1.00		mg/Kg	1	3/22/02
Nickel	12.8	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,740	1.00		mg/Kg	1	3/22/02
Vanadium	72.1	1.00		mg/Kg	1	3/22/02
Zinc	52.9	1.00		mg/Kg	1	3/22/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-02A

Client Sample ID: GP02-01(11-14)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	100		µg/Kg	20	3/28/02
1,1,1-Trichloroethane	ND	100		µg/Kg	20	3/28/02
1,1,2,2-Tetrachloroethane	ND	100		µg/Kg	20	3/28/02
1,1,2-Trichloroethane	ND	100		µg/Kg	20	3/28/02
1,1-Dichloroethane	ND	100		µg/Kg	20	3/28/02
1,1-Dichloroethene	ND	100		µg/Kg	20	3/28/02
1,1-Dichloropropene	ND	100		µg/Kg	20	3/28/02
1,2,3-Trichlorobenzene	ND	100		µg/Kg	20	3/28/02
1,2,3-Trichloropropane	ND	100		µg/Kg	20	3/28/02
1,2,4-Trichlorobenzene	ND	100		µg/Kg	20	3/28/02
1,2,4-Trimethylbenzene	ND	100		µg/Kg	20	3/28/02
1,2-Dibromo-3-chloropropane	ND	200		µg/Kg	20	3/28/02
1,2-Dibromoethane	ND	100		µg/Kg	20	3/28/02
1,2-Dichlorobenzene	ND	100		µg/Kg	20	3/28/02
1,2-Dichloroethane	ND	100		µg/Kg	20	3/28/02
1,2-Dichloropropane	ND	100		µg/Kg	20	3/28/02
1,3,5-Trimethylbenzene	ND	100		µg/Kg	20	3/28/02
1,3-Dichlorobenzene	ND	100		µg/Kg	20	3/28/02
1,3-Dichloropropane	ND	100		µg/Kg	20	3/28/02
1,4-Dichlorobenzene	ND	100		µg/Kg	20	3/28/02
2,2-Dichloropropane	ND	100		µg/Kg	20	3/28/02
2-Butanone	ND	2,000		µg/Kg	20	3/28/02
2-Chloroethyl vinyl ether	ND	1,000		µg/Kg	20	3/28/02
2-Chlorotoluene	ND	100		µg/Kg	20	3/28/02
2-Hexanone	ND	2,000		µg/Kg	20	3/28/02
4-Chlorotoluene	ND	100		µg/Kg	20	3/28/02
4-Isopropyltoluene	ND	100		µg/Kg	20	3/28/02
4-Methyl-2-pentanone	ND	100		µg/Kg	20	3/28/02
Acetone	ND	2,000		µg/Kg	20	3/28/02
Benzene	ND	100		µg/Kg	20	3/28/02
Bromobenzene	ND	100		µg/Kg	20	3/28/02
Bromochloromethane	ND	100		µg/Kg	20	3/28/02
Bromodichloromethane	ND	100		µg/Kg	20	3/28/02
Bromoform	ND	100		µg/Kg	20	3/28/02
Bromomethane	ND	200		µg/Kg	20	3/28/02
Carbon disulfide	ND	100		µg/Kg	20	3/28/02
Carbon tetrachloride	ND	100		µg/Kg	20	3/28/02
Chlorobenzene	ND	100		µg/Kg	20	3/28/02
Chloroethane	ND	200		µg/Kg	20	3/28/02
Chloroform	ND	100		µg/Kg	20	3/28/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-02A

Client Sample ID: GP02-01(11-14)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	200		µg/Kg	20	3/28/02
cis-1,2-Dichloroethene	ND	100		µg/Kg	20	3/28/02
cis-1,3-Dichloropropene	ND	100		µg/Kg	20	3/28/02
Dibromochloromethane	ND	100		µg/Kg	20	3/28/02
Dibromomethane	ND	100		µg/Kg	20	3/28/02
Dichlorodifluoromethane	ND	200		µg/Kg	20	3/28/02
Ethylbenzene	ND	100		µg/Kg	20	3/28/02
Hexachlorobutadiene	ND	100		µg/Kg	20	3/28/02
Iodomethane	ND	100		µg/Kg	20	3/28/02
Isopropylbenzene	ND	100		µg/Kg	20	3/28/02
m,p-Xylene	ND	200		µg/Kg	20	3/28/02
Methyl tert-butyl ether	ND	200		µg/Kg	20	3/28/02
Methylene chloride	ND	2,000		µg/Kg	20	3/28/02
n-Butylbenzene	ND	100		µg/Kg	20	3/28/02
n-Propylbenzene	ND	100		µg/Kg	20	3/28/02
Naphthalene	1,290	200		µg/Kg	20	3/28/02
o-Xylene	ND	100		µg/Kg	20	3/28/02
sec-Butylbenzene	ND	100		µg/Kg	20	3/28/02
Styrene	ND	100		µg/Kg	20	3/28/02
tert-Butylbenzene	ND	100		µg/Kg	20	3/28/02
Tetrachloroethene	ND	100		µg/Kg	20	3/28/02
Toluene	ND	100		µg/Kg	20	3/28/02
trans-1,2-Dichloroethene	ND	100		µg/Kg	20	3/28/02
trans-1,3-Dichloropropene	ND	100		µg/Kg	20	3/28/02
Trichloroethene	ND	100		µg/Kg	20	3/28/02
Trichlorofluoromethane	ND	200		µg/Kg	20	3/28/02
Vinyl acetate	ND	100		µg/Kg	20	3/28/02
Vinyl chloride	ND	200		µg/Kg	20	3/28/02
Surr: 4-Bromofluorobenzene	108.2	74-121		%REC	20	3/28/02
Surr: Dibromofluoromethane	98.2	80-120		%REC	20	3/28/02
Surr: Toluene-d8	102.2	81-117		%REC	20	3/28/02

Qualifiers:

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-02A

Client Sample ID: GP02-01(11-14)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	1,000	50.0		µg/Kg	1	3/25/02
Acenaphthylene	925	50.0		µg/Kg	1	3/25/02
Anthracene	2,100	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	2,600	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	2,980	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	1,760	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	2,290	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	1,700	50.0		µg/Kg	1	3/25/02
Chrysene	3,540	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	335	50.0		µg/Kg	1	3/25/02
Fluoranthene	5,500	50.0		µg/Kg	1	3/25/02
Fluorene	1,360	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	1,600	50.0		µg/Kg	1	3/25/02
Naphthalene	355	50.0		µg/Kg	1	3/25/02
Phenanthrene	6,200	50.0		µg/Kg	1	3/25/02
Pyrene	7,100	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	115.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	124.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	93.0	23-120		%REC	1	3/25/02

Qualifiers:

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-03A

Client Sample ID: GP02-01(23-24)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	16.4	0.800		mg/Kg	10	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	2.12	1.00		mg/Kg	1	3/22/02
Barium	72.3	1.00		mg/Kg	1	3/22/02
Chromium	13.0	1.00		mg/Kg	1	3/22/02
Cobalt	9.47	1.00		mg/Kg	1	3/22/02
Copper	13.1	1.00		mg/Kg	1	3/22/02
Iron	18,700	2.00		mg/Kg	1	3/22/02
Lead	35.2	1.00		mg/Kg	1	3/22/02
Magnesium	2,450	10.0		mg/Kg	1	3/22/02
Manganese	197	1.00		mg/Kg	1	3/22/02
Nickel	15.5	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,130	1.00		mg/Kg	1	3/22/02
Vanadium	66.1	1.00		mg/Kg	1	3/22/02
Zinc	39.0	1.00		mg/Kg	1	3/22/02

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R - RPD outside accepted recovery limits
E - Value above quantitation range

SCOEPA00011643

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-03A

Client Sample ID: GP02-01(23-24)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1,000		µg/Kg	200	3/28/02
1,1,1-Trichloroethane	ND	1,000		µg/Kg	200	3/28/02
1,1,2,2-Tetrachloroethane	ND	1,000		µg/Kg	200	3/28/02
1,1,2-Trichloroethane	ND	1,000		µg/Kg	200	3/28/02
1,1-Dichloroethane	ND	1,000		µg/Kg	200	3/28/02
1,1-Dichloroethene	ND	1,000		µg/Kg	200	3/28/02
1,1-Dichloropropene	ND	1,000		µg/Kg	200	3/28/02
1,2,3-Trichlorobenzene	ND	1,000		µg/Kg	200	3/28/02
1,2,3-Trichloropropane	ND	1,000		µg/Kg	200	3/28/02
1,2,4-Trichlorobenzene	ND	1,000		µg/Kg	200	3/28/02
1,2,4-Trimethylbenzene	43,100	1,000		µg/Kg	200	3/28/02
1,2-Dibromo-3-chloropropane	ND	2,000		µg/Kg	200	3/28/02
1,2-Dibromoethane	ND	1,000		µg/Kg	200	3/28/02
1,2-Dichlorobenzene	ND	1,000		µg/Kg	200	3/28/02
1,2-Dichloroethane	ND	1,000		µg/Kg	200	3/28/02
1,2-Dichloropropane	ND	1,000		µg/Kg	200	3/28/02
1,3,5-Trimethylbenzene	13,700	1,000		µg/Kg	200	3/28/02
1,3-Dichlorobenzene	ND	1,000		µg/Kg	200	3/28/02
1,3-Dichloropropane	ND	1,000		µg/Kg	200	3/28/02
1,4-Dichlorobenzene	ND	1,000		µg/Kg	200	3/28/02
2,2-Dichloropropane	ND	1,000		µg/Kg	200	3/28/02
2-Butanone	ND	20,000		µg/Kg	200	3/28/02
2-Chloroethyl vinyl ether	ND	10,000		µg/Kg	200	3/28/02
2-Chlorotoluene	2,930	1,000		µg/Kg	200	3/28/02
2-Hexanone	ND	20,000		µg/Kg	200	3/28/02
4-Chlorotoluene	ND	1,000		µg/Kg	200	3/28/02
4-Isopropyltoluene	3,480	1,000		µg/Kg	200	3/28/02
4-Methyl-2-pentanone	ND	1,000		µg/Kg	200	3/28/02
Acetone	ND	20,000		µg/Kg	200	3/28/02
Benzene	42,700	1,000		µg/Kg	200	3/28/02
Bromobenzene	ND	1,000		µg/Kg	200	3/28/02
Bromochloromethane	ND	1,000		µg/Kg	200	3/28/02
Bromodichloromethane	ND	1,000		µg/Kg	200	3/28/02
Bromoform	ND	1,000		µg/Kg	200	3/28/02
Bromomethane	ND	2,000		µg/Kg	200	3/28/02
Carbon disulfide	ND	1,000		µg/Kg	200	3/28/02
Carbon tetrachloride	ND	1,000		µg/Kg	200	3/28/02
Chlorobenzene	ND	1,000		µg/Kg	200	3/28/02
Chloroethane	ND	2,000		µg/Kg	200	3/28/02
Chloroform	ND	1,000		µg/Kg	200	3/28/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-03A

Client Sample ID: GP02-01(23-24)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2,000		µg/Kg	200	3/28/02
cis-1,2-Dichloroethene	ND	1,000		µg/Kg	200	3/28/02
cis-1,3-Dichloropropene	ND	1,000		µg/Kg	200	3/28/02
Dibromochloromethane	ND	1,000		µg/Kg	200	3/28/02
Dibromomethane	ND	1,000		µg/Kg	200	3/28/02
Dichlorodifluoromethane	ND	2,000		µg/Kg	200	3/28/02
Ethylbenzene	62,400	1,000		µg/Kg	200	3/28/02
Hexachlorobutadiene	ND	1,000		µg/Kg	200	3/28/02
Iodomethane	ND	1,000		µg/Kg	200	3/28/02
Isopropylbenzene	4,670	1,000		µg/Kg	200	3/28/02
m,p-Xylene	70,700	2,000		µg/Kg	200	3/28/02
Methyl tert-butyl ether	ND	2,000		µg/Kg	200	3/28/02
Methylene chloride	ND	20,000		µg/Kg	200	3/28/02
n-Butylbenzene	1,420	1,000		µg/Kg	200	3/28/02
n-Propylbenzene	2,940	1,000		µg/Kg	200	3/28/02
Naphthalene	3,140,000	100,000		µg/Kg	200	3/28/02
o-Xylene	33,400	1,000		µg/Kg	200	3/28/02
sec-Butylbenzene	ND	1,000		µg/Kg	200	3/28/02
Styrene	ND	1,000		µg/Kg	200	3/28/02
tert-Butylbenzene	ND	1,000		µg/Kg	200	3/28/02
Tetrachloroethene	ND	1,000		µg/Kg	200	3/28/02
Toluene	53,700	1,000		µg/Kg	200	3/28/02
trans-1,2-Dichloroethene	ND	1,000		µg/Kg	200	3/28/02
trans-1,3-Dichloropropene	ND	1,000		µg/Kg	200	3/28/02
Trichloroethene	ND	1,000		µg/Kg	200	3/28/02
Trichlorofluoromethane	ND	2,000		µg/Kg	200	3/28/02
Vinyl acetate	ND	1,000		µg/Kg	200	3/28/02
Vinyl chloride	ND	2,000		µg/Kg	200	3/28/02
Surr: 4-Bromofluorobenzene	103.4	74-121		%REC	200	3/28/02
Surr: Dibromofluoromethane	93.6	80-120		%REC	200	3/28/02
Surr: Toluene-d8	101.2	81-117		%REC	200	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS
Lab ID: 0203188-03A

Client Sample ID: GP02-01(23-24)
Tag Number:
Collection Date: 3/19/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	30,000	50,000		µg/Kg	1000	3/25/02
Acenaphthylene	45,000	50,000		µg/Kg	1000	3/25/02
Anthracene	50,000	50,000		µg/Kg	1000	3/25/02
Benz(a)anthracene	26,000	50,000		µg/Kg	1000	3/25/02
Benzo(a)pyrene	26,000	50,000		µg/Kg	1000	3/25/02
Benzo(b)fluoranthene	13,000	50,000		µg/Kg	1000	3/25/02
Benzo(g,h,i)perylene	18,000	50,000		µg/Kg	1000	3/25/02
Benzo(k)fluoranthene	18,000	50,000		µg/Kg	1000	3/25/02
Chrysene	40,000	50,000		µg/Kg	1000	3/25/02
Dibenz(a,h)anthracene	5,000	50,000		µg/Kg	1000	3/25/02
Fluoranthene	100,000	50,000		µg/Kg	1000	3/25/02
Fluorene	44,000	50,000		µg/Kg	1000	3/25/02
Indeno(1,2,3-cd)pyrene	13,000	50,000		µg/Kg	1000	3/25/02
Naphthalene	433,000	50,000		µg/Kg	1000	3/25/02
Phenanthrene	233,000	50,000		µg/Kg	1000	3/25/02
Pyrene	112,000	50,000		µg/Kg	1000	3/25/02
Surr: 2-Fluorobiphenyl	00.0	30-115	S, X	%REC	1000	3/25/02
Surr: 4-Terphenyl-d14	00.0	18-137	S, X	%REC	1000	3/25/02
Surr: Nitrobenzene-d5	00.0	23-120	S, X	%REC	1000	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203188** Run ID: **HIT MAN_020326A** SeqNo: **113193**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011647

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113845**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5									
1,1,1-Trichloroethane	ND	5									
1,1,2,2-Tetrachloroethane	ND	5									
1,1,2-Trichloroethane	ND	5									
1,1-Dichloroethane	ND	5									
1,1-Dichloroethene	ND	5									
1,1-Dichloropropene	ND	5									
1,2,3-Trichlorobenzene	ND	5									
1,2,3-Trichloropropane	ND	5									
1,2,4-Trichlorobenzene	ND	5									
1,2,4-Trimethylbenzene	ND	5									
1,2-Dibromo-3-chloropropane	ND	10									
1,2-Dibromoethane	ND	5									
1,2-Dichlorobenzene	ND	5									
1,2-Dichloroethane	ND	5									
1,2-Dichloropropane	ND	5									
1,3,5-Trimethylbenzene	ND	5									
1,3-Dichlorobenzene	ND	5									
1,3-Dichloropropane	ND	5									
1,4-Dichlorobenzene	ND	5									
2,2-Dichloropropane	ND	5									
2-Butanone	ND	100									
2-Chloroethyl vinyl ether	ND	50									
2-Chlorotoluene	ND	5									
2-Hexanone	ND	100									
4-Chlorotoluene	ND	5									
4-Isopropyltoluene	ND	5									
4-Methyl-2-pentanone	ND	5									
Acetone	ND	100									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Method Blank

Benzene	ND	5
Bromobenzene	ND	5
Bromochloromethane	ND	5
Bromodichloromethane	ND	5
Bromoform	ND	5
Bromomethane	ND	10
Carbon disulfide	ND	5
Carbon tetrachloride	ND	5
Chlorobenzene	ND	5
Chloroethane	ND	10
Chloroform	ND	5
Chloromethane	ND	10
cis-1,2-Dichloroethene	ND	5
cis-1,3-Dichloropropene	ND	5
Dibromochloromethane	ND	5
Dibromomethane	ND	5
Dichlorodifluoromethane	ND	10
Ethylbenzene	ND	5
Hexachlorobutadiene	ND	5
Iodomethane	ND	5
Isopropylbenzene	ND	5
m,p-Xylene	ND	10
Methyl tert-butyl ether	ND	10
Methylene chloride	ND	100
n-Butylbenzene	ND	5
n-Propylbenzene	ND	5
Naphthalene	ND	10
o-Xylene	ND	5
sec-Butylbenzene	ND	5
Styrene	ND	5
tert-Butylbenzene	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	5						
trans-1,3-Dichloropropene	ND	5						
Trichloroethene	ND	5						
Trichlorofluoromethane	ND	10						
Vinyl acetate	ND	5						
Vinyl chloride	ND	10						
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0
Dibromofluoromethane	54.7	0	50	0	109.4%	86	118	0
Toluene-d8	51.9	0	50	0	103.8%	88	110	0

Sample ID: **MB-4027** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**

Client ID: **0203188** Run ID: **ICP_020322A** SeqNo: **112904**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Barium	ND	1									
Chromium	ND	1									
Cobalt	ND	1									
Copper	ND	1									
Iron	ND	2									
Lead	ND	1									
Magnesium	ND	10									
Manganese	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Titanium	ND	1									
Vanadium	ND	1									
Zinc	ND	1									

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									
2-Fluorobiphenyl	570	0	500	0	114.0%	30	115	0			
4-Terphenyl-d14	680	0	500	0	136.0%	18	137	0			
Nitrobenzene-d5	540	0	500	0	108.0%	23	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203188-01A DUP** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**

Client ID: **GP02-01(3-5)** **0203188** Run ID: **HIT MAN_020326A** SeqNo: **113196**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.08	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203201-03B DUP** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113851**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	100	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	50	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	100	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	100	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	5	0	0	0.0%	0	0	6.4	0.0%	20	
Bromobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromochloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromodichloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromoform	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromomethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Carbon disulfide	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Carbon tetrachloride	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chloroethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Chloroform	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chloromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
cis-1,2-Dichloroethene	32.5	5	0	0	0.0%	0	0	17.2	61.6%	20	R, Q
cis-1,3-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dibromochloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dibromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dichlorodifluoromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Hexachlorobutadiene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Isopropylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methylene chloride	ND	100	0	0	0.0%	0	0	0	0.0%	20	
n-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	ND	10	0	0	0.0%	0	0	14.2	0.0%	20	
o-Xylene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
sec-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Styrene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
tert-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Tetrachloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
trans-1,3-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Trichloroethene	5.65	5	0	0	0.0%	0	0	0	200.0%	20	R, Q
Trichlorofluoromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Vinyl acetate	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Vinyl chloride	ND	10	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	59.6	0	50	0	119.2%	74	121	0	0.0%	0	
Dibromofluoromethane	51.4	0	50	0	102.8%	80	120	0	0.0%	0	
Toluene-d8	57.1	0	50	0	114.2%	81	117	0	0.0%	0	

Sample ID: **0203188-02A DUP** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**

Client ID: **GP02-01(11-14)** **0203188** Run ID: **ICP_020322A** SeqNo: **112910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Arsenic	2.26	1	0	0	0.0%	0	0	2.33	3.1%	20	
Barium	73.6	1	0	0	0.0%	0	0	80.4	8.8%	20	
Chromium	12.6	1	0	0	0.0%	0	0	13.3	5.4%	20	
Cobalt	12.8	1	0	0	0.0%	0	0	13.5	5.3%	20	
Copper	13.7	1	0	0	0.0%	0	0	13.5	1.5%	20	
Iron	23200	4	0	0	0.0%	0	0	24200	4.2%	20	
Lead	4.1	1	0	0	0.0%	0	0	4.72	14.1%	20	
Magnesium	2720	10	0	0	0.0%	0	0	2820	3.6%	20	
Manganese	291	1	0	0	0.0%	0	0	287	1.4%	20	
Nickel	13.8	1	0	0	0.0%	0	0	12.8	7.5%	20	
Selenium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Silver	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Titanium	1710	1	0	0	0.0%	0	0	1740	1.7%	20	
Vanadium	67.3	1	0	0	0.0%	0	0	72.1	6.9%	20	
Zinc	46.1	1	0	0	0.0%	0	0	52.9	13.7%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011655

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203188-01A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **GP02-01(3-5)** **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Naphthalene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Phenanthrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	495	0	500	0	99.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-11A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113349**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	55	50	0	0	0.0%	0	0	50	9.5%	30	
Anthracene	75	50	0	0	0.0%	0	0	75	0.0%	30	
Benz(a)anthracene	255	50	0	0	0.0%	0	0	275	7.5%	30	
Benzo(a)pyrene	465	50	0	0	0.0%	0	0	440	5.5%	30	
Benzo(b)fluoranthene	245	50	0	0	0.0%	0	0	235	4.2%	30	
Benzo(g,h,i)perylene	435	50	0	0	0.0%	0	0	405	7.1%	30	
Benzo(k)fluoranthene	235	50	0	0	0.0%	0	0	270	13.9%	30	
Chrysene	410	50	0	0	0.0%	0	0	395	3.7%	30	
Dibenz(a,h)anthracene	75	50	0	0	0.0%	0	0	70	6.9%	30	
Fluoranthene	560	50	0	0	0.0%	0	0	675	18.6%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	305	50	0	0	0.0%	0	0	285	6.8%	30	
Naphthalene	50	50	0	0	0.0%	0	0	0	200.0%	30	R, T
Phenanthrene	110	50	0	0	0.0%	0	0	160	37.0%	30	R, T
Pyrene	595	50	0	0	0.0%	0	0	690	14.8%	30	
2-Fluorobiphenyl	650	0	500	0	130.0%	30	115	0	0.0%	30	S, MI
4-Terphenyl-d14	635	0	500	0	127.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	600	0	500	0	120.0%	23	120	0	0.0%	30	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203188-02A MS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **GP02-01(11-14)** **0203188** Run ID: **HIT MAN_020326A** SeqNo: **113198**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.836	0.08	0.2	0.34	124.0%	75	125	0			

Sample ID: **0203188-01A MS** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **GP02-01(3-5)** **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	51.2	5	50	0	102.4%	0	234	0			
Benzene	52.5	5	50	0	105.0%	37	151	0			
Chlorobenzene	55.3	5	50	0	110.6%	37	160	0			
Toluene	54.54	5	50	0	109.1%	47	150	0			
Trichloroethene	47.3	5	50	0	94.6%	71	157	0			
4-Bromofluorobenzene	53.9	0	50	0	107.8%	74	121	0			
Dibromofluoromethane	50.3	0	50	0	100.6%	80	120	0			
Toluene-d8	51.4	0	50	0	102.8%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203188-01A MS** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **GP02-01(3-5)** **0203188** Run ID: **ICP_020322A** SeqNo: **112907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	18.3	1	50	0	36.6%	75	125	0			S,MI
Arsenic	43	1	50	1.83	82.3%	75	125	0			
Barium	161	1	50	112	98.0%	75	125	0			
Chromium	67	1	50	22.3	89.4%	75	125	0			
Cobalt	56.9	1	50	13	87.8%	75	125	0			
Copper	69.9	1	50	21.9	96.0%	75	125	0			
Iron	25500	4	500	25200	60.0%	75	125	0			S,M
Lead	56.3	1	50	9.87	92.9%	75	125	0			
Magnesium	4730	10	500	4330	80.0%	75	125	0			
Manganese	378	1	50	316	124.0%	75	125	0			
Nickel	62	1	50	18.3	87.4%	75	125	0			
Selenium	40.4	1	50	0	80.8%	75	125	0			
Silver	43.9	1	50	0	87.8%	75	125	0			
Titanium	1430	1	50	1490	-120.0%	75	125	0			S,M
Vanadium	113	1	50	68.5	89.0%	75	125	0			
Zinc	137	1	50	80.8	112.4%	75	125	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Sample Matrix Spike Duplicate

Sample ID: **0203188-01A MSD** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **GP02-01(3-5)** **0203188** Run ID: **ICP_020322A** SeqNo: **112908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	20.5	1	50	0	41.0%	75	125	18.3	11.3%	20	S
Arsenic	43.2	1	50	1.83	82.7%	75	125	43	0.5%	20	
Barium	158	1	50	112	92.0%	75	125	161	1.9%	20	
Chromium	66.5	1	50	22.3	88.4%	75	125	67	0.7%	20	
Cobalt	57.1	1	50	13	88.2%	75	125	56.9	0.4%	20	
Copper	67.8	1	50	21.9	91.8%	75	125	69.9	3.1%	20	
Iron	25100	4	500	25200	-20.0%	75	125	25500	1.6%	20	S
Lead	54.3	1	50	9.87	88.9%	75	125	56.3	3.6%	20	
Magnesium	4730	10	500	4330	80.0%	75	125	4730	0.0%	20	
Manganese	364	1	50	316	96.0%	75	125	378	3.8%	20	
Nickel	61.7	1	50	18.3	86.8%	75	125	62	0.5%	20	
Selenium	41.2	1	50	0	82.4%	75	125	40.4	2.0%	20	
Silver	44.3	1	50	0	88.6%	75	125	43.9	0.9%	20	
Titanium	1440	1	50	1490	-100.0%	75	125	1430	0.7%	20	S
Vanadium	112	1	50	68.5	87.0%	75	125	113	0.9%	20	
Zinc	129	1	50	80.8	96.4%	75	125	137	6.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203188-02A MS** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **GP02-01(11-14)** **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113187**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1055	50	500	1000	11.0%	47	145	0			S, MI
Acenaphthylene	1055	50	500	925	26.0%	33	145	0			S, MI
Anthracene	1775	50	500	2100	-65.0%	27	133	0			S, MI
Benz(a)anthracene	1865	50	500	2600	-147.0%	33	143	0			S, MI
Benzo(a)pyrene	2035	50	500	2980	-189.0%	17	163	0			S, MI
Benzo(b)fluoranthene	1425	50	500	1760	-67.0%	24	159	0			S, MI
Benzo(g,h,i)perylene	1715	50	500	2290	-115.0%	1	219	0			S, MI
Benzo(k)fluoranthene	1325	50	500	1700	-75.0%	11	162	0			S, MI
Chrysene	2355	50	500	3540	-237.0%	17	168	0			S, MI
Dibenz(a,h)anthracene	810	50	500	335	95.0%	1	227	0			
Fluoranthene	3800	50	500	5500	-340.0%	26	137	0			S, MI
Fluorene	1365	50	500	1360	1.0%	59	121	0			S, MI
Indeno(1,2,3-cd)pyrene	1380	50	500	1600	-44.0%	1	171	0			S, MI
Naphthalene	720	50	500	355	73.0%	21	133	0			
Phenanthrene	4350	50	500	6200	-370.0%	54	120	0			S, MI
Pyrene	4450	50	500	7100	-530.0%	52	115	0			S, MI
2-Fluorobiphenyl	660	0	500	0	132.0%	30	115	0			S, MI
4-Terphenyl-d14	640	0	500	0	128.0%	18	137	0			
Nitrobenzene-d5	570	0	500	0	114.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011661

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203188** Run ID: **HIT MAN_020326A** SeqNo: **113194**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.205	0.04	0.2	0	102.5%	85	115	0			

Sample ID: **LCS** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	111.5	5	100	0	111.5%	0	234	0			
Benzene	91.5	5	100	0	91.5%	37	151	0			
Chlorobenzene	86	5	100	0	86.0%	37	160	0			
Toluene	91	5	100	0	91.0%	47	150	0			
Trichloroethene	85	5	100	0	85.0%	71	157	0			
4-Bromofluorobenzene	49.6	0	50	0	99.2%	74	121	0			
Dibromofluoromethane	56.7	0	50	0	113.4%	80	120	0			
Toluene-d8	50.2	0	50	0	100.4%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID: **LCS-4027** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203188** Run ID: **ICP_020322A** SeqNo: **112905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	45.6	1	50	0	91.2%	80	120	0			
Arsenic	44.8	1	50	0	89.6%	80	120	0			
Barium	48.8	1	50	0	97.6%	80	120	0			
Chromium	48.8	1	50	0	97.6%	80	120	0			
Cobalt	48.1	1	50	0	96.2%	80	120	0			
Copper	47.9	1	50	0	95.8%	80	120	0			
Iron	497	2	500	0	99.4%	80	120	0			
Lead	47.6	1	50	0	95.2%	80	120	0			
Magnesium	472	10	500	0	94.4%	80	120	0			
Manganese	48.2	1	50	0	96.4%	80	120	0			
Nickel	47.8	1	50	0	95.6%	80	120	0			
Selenium	45.1	1	50	0	90.2%	80	120	0			
Silver	46.4	1	50	0	92.8%	80	120	0			
Titanium	49.9	1	50	0	99.8%	80	120	0			
Vanadium	48.5	1	50	0	97.0%	80	120	0			
Zinc	46.9	1	50	0	93.8%	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	515	50	500	0	103.0%	47	145	0			
Acenaphthylene	490	50	500	0	98.0%	33	145	0			
Anthracene	570	50	500	0	114.0%	27	133	0			
Benz(a)anthracene	390	50	500	0	78.0%	33	143	0			
Benzo(a)pyrene	320	50	500	0	64.0%	17	163	0			
Benzo(b)fluoranthene	350	50	500	0	70.0%	24	159	0			
Benzo(g,h,i)perylene	465	50	500	0	93.0%	1	219	0			
Benzo(k)fluoranthene	595	50	500	0	119.0%	11	162	0			
Chrysene	585	50	500	0	117.0%	17	168	0			
Dibenz(a,h)anthracene	395	50	500	0	79.0%	1	227	0			
Fluoranthene	545	50	500	0	109.0%	26	137	0			
Fluorene	515	50	500	0	103.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	430	50	500	0	86.0%	1	171	0			
Naphthalene	505	50	500	0	101.0%	21	133	0			
Phenanthrene	460	50	500	0	92.0%	54	120	0			
Pyrene	525	50	500	0	105.0%	52	115	0			
2-Fluorobiphenyl	575	0	500	0	115.0%	30	115	0			
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0			
Nitrobenzene-d5	470	0	500	0	94.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113178**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	560	50	500	0	112.0%	47	145	515	8.4%	30	
Acenaphthylene	530	50	500	0	106.0%	33	145	490	7.8%	30	
Anthracene	615	50	500	0	123.0%	27	133	570	7.6%	30	
Benz(a)anthracene	425	50	500	0	85.0%	33	143	390	8.6%	30	
Benzo(a)pyrene	405	50	500	0	81.0%	17	163	320	23.4%	30	
Benzo(b)fluoranthene	400	50	500	0	80.0%	24	159	350	13.3%	30	
Benzo(g,h,i)perylene	495	50	500	0	99.0%	1	219	465	6.3%	30	
Benzo(k)fluoranthene	620	50	500	0	124.0%	11	162	595	4.1%	30	
Chrysene	625	50	500	0	125.0%	17	168	585	6.6%	30	
Dibenz(a,h)anthracene	465	50	500	0	93.0%	1	227	395	16.3%	30	
Fluoranthene	655	50	500	0	131.0%	26	137	545	18.3%	30	
Fluorene	550	50	500	0	110.0%	59	121	515	6.6%	30	
Indeno(1,2,3-cd)pyrene	450	50	500	0	90.0%	1	171	430	4.5%	30	
Naphthalene	555	50	500	0	111.0%	21	133	505	9.4%	30	
Phenanthrene	515	50	500	0	103.0%	54	120	460	11.3%	30	
Pyrene	510	50	500	0	102.0%	52	115	525	2.9%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	545	0	500	0	109.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	490	0	500	0	98.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/28/02** Prep Date:

Client ID: **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113846**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	53.6	5	50	0	107.2%	80	120	0			
1,2-Dichloropropane	50.5	5	50	0	101.0%	80	120	0			
Chloroform	47.3	5	50	0	94.6%	80	120	0			
Ethylbenzene	52.5	5	50	0	105.0%	80	120	0			
Toluene	49.1	5	50	0	98.2%	80	120	0			
Vinyl chloride	53.4	10	50	0	106.8%	80	120	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	48.6	0	50	0	97.2%	86	118	0			
Toluene-d8	49.7	0	50	0	99.4%	88	110	0			

Sample ID: **CCV** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:

Client ID: **0203188** Run ID: **ANGSTROM_020328A** SeqNo: **113846**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	53.6	5	50	0	107.2%	80	120	0			
1,2-Dichloropropane	50.5	5	50	0	101.0%	80	120	0			
Chloroform	47.3	5	50	0	94.6%	80	120	0			
Ethylbenzene	52.5	5	50	0	105.0%	80	120	0			
Toluene	49.1	5	50	0	98.2%	80	120	0			
Vinyl chloride	53.4	10	50	0	106.8%	80	120	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	48.6	0	50	0	97.2%	86	118	0			
Toluene-d8	49.7	0	50	0	99.4%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/25/02** Prep Date:

Client ID: **0203188** Run ID: **MANFREDD_020325B** SeqNo: **113176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.97	0.1	1	0	97.0%	80	120	0			
Acenaphthylene	.96	0.1	1	0	96.0%	80	120	0			
Anthracene	1.08	0.1	1	0	108.0%	80	120	0			
Benz(a)anthracene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(a)pyrene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(b)fluoranthene	.8	0.1	1	0	80.0%	80	120	0			
Benzo(g,h,i)perylene	.9	0.1	1	0	90.0%	80	120	0			
Benzo(k)fluoranthene	.97	0.1	1	0	97.0%	80	120	0			
Chrysene	1.09	0.1	1	0	109.0%	80	120	0			
Dibenz(a,h)anthracene	.85	0.1	1	0	85.0%	80	120	0			
Fluoranthene	1.1	0.1	1	0	110.0%	80	120	0			
Fluorene	1.02	0.1	1	0	102.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.84	0.1	1	0	84.0%	80	120	0			
Naphthalene	1.2	0.1	1	0	120.0%	80	120	0			
Phenanthrene	.97	0.1	1	0	97.0%	80	120	0			
Pyrene	.95	0.1	1	0	95.0%	80	120	0			
2-Fluorobiphenyl	.97	0	1	0	97.0%	30	115	0			
4-Terphenyl-d14	.85	0	1	0	85.0%	18	137	0			
Nitrobenzene-d5	1.03	0	1	0	103.0%	23	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *02-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203188
Project: PDX WAC/ WACKER SILTRONICS

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203188** Run ID: **ICP_020322A** SeqNo: **112903**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	24.9	0.01	25	0	99.6%	90	110	0			
Magnesium	24.7	0.05	25	0	98.8%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203188** Run ID: **ICP_020322A** SeqNo: **112902**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	.476	0.005	0.5	0	95.2%	90	110	0			
Arsenic	.484	0.005	0.5	0	96.8%	90	110	0			
Barium	.498	0.005	0.5	0	99.6%	90	110	0			
Chromium	.492	0.005	0.5	0	98.4%	90	110	0			
Cobalt	.49	0.005	0.5	0	98.0%	90	110	0			
Copper	.48	0.005	0.5	0	96.0%	90	110	0			
Iron	.492	0.01	0.5	0	98.4%	90	110	0			
Lead	.494	0.005	0.5	0	98.8%	90	110	0			
Manganese	.489	0.005	0.5	0	97.8%	90	110	0			
Nickel	.494	0.005	0.5	0	98.8%	90	110	0			
Selenium	.489	0.005	0.5	0	97.8%	90	110	0			
Silver	.485	0.005	0.5	0	97.0%	90	110	0			
Titanium	.516	0.01	0.5	0	103.2%	90	110	0			
Vanadium	.493	0.005	0.5	0	98.6%	90	110	0			
Zinc	.485	0.005	0.5	0	97.0%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

ENVIRONMENTAL SERVICES LABORATORY -- GLOSSARY OF FLAGS

Qualifier	Description
AA	This sample was analyzed after the holding time had expired.
AB	The hydrocarbon pattern in this sample is not typical of gasoline.
AC	The hydrocarbon pattern in this sample is not typical of diesel.
AD	The hydrocarbon pattern in this sample is not typical of oil.
AE	The hydrocarbon pattern in this sample extends into the gasoline range.
AF	The hydrocarbon pattern in this sample extends into the diesel range.
AG	The hydrocarbon pattern in this sample extends into the oil range.
A	This analysis was performed on a VOA sample containing headspace.
B	Analyte detected in the Method Blank above the reporting level.
C	The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
D	The sample was supplied in an inappropriate container, according to method criteria.
E	This value is above the quantitation limit. It is considered an estimate.
H	The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
J	The result is above the Method Detection Limit (MDL) and below the Reporting Level (RL). It is considered an estimate.
M	The MS/MSD recoveries are not calcuable due to a high amount of analyte in sample.
MI	This indicates a high level of matrix interference affecting the spike or surrogate recovery.
N	See case narrative.
O	Detection Limits are elevated due to sample dilution. See case narrative.
Q	Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
R	The RPD result is outside method control limits. See other qualifiers or case narrative.
S	The spike recovery is outside method control limits. See other qualifiers or case narrative.
T	The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
X	Unable to quantitate surrogate recovery due to sample dilution.

Rev. 04/25/00

Environmental Services Laboratory, Inc

CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

Company: Limno-Tech, Inc
Project Manager: Kathi Futornick
LABORATORY # 0203188
Address: 4640 SW Macadam Ave Ste 60
Phone: 503-248-1768 Fax: 503-248-1959

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles 8260	8270 GCMS Semivolatiles 8270 SIM	8081 GC Pesticides/PCBs	8081m PCBs only	RCRA Metals (8)	Priority Pollutant Metals (13)	Metals: 6010/7000	TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	Cyanide 9010	# OF CONTAINERS
GP02-01 (3'-5')	3/19 2002	08:42	SOIL	-01					X			X	X					X				X	3
GP02-01 (11'-14')	3/19 2002	08:56	SOIL	-02					X			X	X					X				X	3
GP02-01 (23'-24')	3/19 2002	09:10	SOIL	-03					X			X	X					X				X	3

Analyses: VOC 8010B (report all analytes, not just TCE)
SVOC's 8270 SIM
Cyanide EPA 9010
Metals (Sb, As, Ba, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Ti, Va, Zn) 6010/7000 Series

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER: PDXWAC	TOTAL NUMBER OF CONTAINERS
PROJECT NAME: Wacker Siltronics	COC SEALS INTACT? Y / N / NA
PURCHASE ORDER NUMBER:	RECEIVED INTACT? Y / N
ONGOING PROJECT? YES ☒ NO ☐	RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS:

Sampled by: Joyce S Dunkin

Received via:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Joyce S Dunkin Time 5:50pm	SIGNATURE: Time	SIGNATURE: Time
Printed Name: Joyce S Dunkin Date 3/8/02	Printed Name: Date	Printed Name: Date
Company: LTI	Company:	Company:
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: [signature] Time 5:50pm	Signature: Time	Signature: Time
Printed Name: Cuyo Chout Date 3/19/02	Printed Name: Date	Printed Name: Date
Company: ESL	Company:	ESL Inc.:

DISTRIBUTION: White, Canary - ESL, Pink - Originator

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

April 05, 2002

Kathi Futernick
Limno-Tech, Inc.
4640 SW Macadam Ave
Ste 60
Portland, OR 97201
TEL: (503) 248-1768
FAX (503) 248-1959

RE: PDX WAC/ Wacker Siltronics Order No.: 0203193

Dear Kathi Futernick,

Environmental Services Laboratory received 13 samples on 3/20/02 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
- BNA Semi-Vol Organics, Aqueous (EPA 8270C)
- Cyanide (EPA 9010B)
- ICP Metals (EPA 200.7)
- ICP Metals (EPA 6010B)
- PAH BY SIM, Soil (8270-SIM)
- Volatiles by GC/MS (EPA 8260B)

Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓Base Sample Report ✓Method Blank Report ✓Sample Duplicate Report
✓Matrix Spike Report ✓Laboratory Control Spike ✓Continuing Calibration Verification Report ✓Initial Calibration Verification Report
If you have any questions regarding these test results, please feel free to call.

Sincerely,

Leslie Rush
Project Manager

Keith Hunter
Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-01A

Client Sample ID: GP02-01 (34-38)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	4.41	0.200		mg/L	5	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	0.00950	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	0.0973	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	0.00710	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	99.0	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	78.7	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	10.5	0.0100		mg/L	1	3/26/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	0.00630	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	0.0159	0.00500		mg/L	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-01A

Client Sample ID: GP02-01 (34-38)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	3.25	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-01A

Client Sample ID: GP02-01 (34-38)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	85.3	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	2.01	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	105.6	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	98.4	86-118		%REC	1	3/27/02
Surr: Toluene-d8	104.0	88-110		%REC	1	3/27/02

Qualifiers:

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* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-01A

Client Sample ID: GP02-01 (34-38)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: **mrs**
Acenaphthene	ND	2.00		µg/L	1	3/26/02
Acenaphthylene	ND	2.00		µg/L	1	3/26/02
Anthracene	ND	2.00		µg/L	1	3/26/02
Benz(a)anthracene	ND	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	ND	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	ND	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	ND	2.00		µg/L	1	3/26/02
Fluorene	ND	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	ND	2.00		µg/L	1	3/26/02
Pyrene	ND	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	95.8	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	84.6	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	48.1	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	89.4	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	80.4	35-114		%REC	1	3/26/02
Surr: Phenol-d5	31.9	10-94		%REC	1	3/26/02

Qualifiers:

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R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-02A

Client Sample ID: GP02-01 (56-60)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	0.00750	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	0.0601	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	59.1	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	32.9	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	4.64	0.00500		mg/L	1	3/26/02
Nickel, 200.7 Diss	0.00770	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	0.0331	0.00500		mg/L	1	3/26/02

Qualifiers:

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R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-02A

Client Sample ID: GP02-01 (56-60)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	ND	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-02A

Client Sample ID: GP02-01 (56-60)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	ND	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	104.4	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	101.2	86-118		%REC	1	3/27/02
Surr: Toluene-d8	100.8	88-110		%REC	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-02A

Client Sample ID: GP02-01 (56-60)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: **mrs**
Acenaphthene	ND	2.00		µg/L	1	3/26/02
Acenaphthylene	ND	2.00		µg/L	1	3/26/02
Anthracene	ND	2.00		µg/L	1	3/26/02
Benz(a)anthracene	ND	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	ND	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	ND	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	ND	2.00		µg/L	1	3/26/02
Fluorene	ND	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	ND	2.00		µg/L	1	3/26/02
Pyrene	ND	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	85.2	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	74.8	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	44.1	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	90.8	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	75.6	35-114		%REC	1	3/26/02
Surr: Phenol-d5	29.2	10-94		%REC	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-03A

Client Sample ID: GP02-01 (96-100)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	0.00750	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	0.0447	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	48.8	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	26.7	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	2.91	0.00500		mg/L	1	3/26/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	0.0153	0.00500		mg/L	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-03A

Client Sample ID: GP02-01 (96-100)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	ND	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-03A

Client Sample ID: GP02-01 (96-100)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	ND	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	106.2	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	96.0	86-118		%REC	1	3/27/02
Surr: Toluene-d8	103.0	88-110		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-03A

Client Sample ID: GP02-01 (96-100)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: mrs
Acenaphthene	ND	2.00		µg/L	1	3/26/02
Acenaphthylene	ND	2.00		µg/L	1	3/26/02
Anthracene	ND	2.00		µg/L	1	3/26/02
Benz(a)anthracene	ND	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	ND	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	ND	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	ND	2.00		µg/L	1	3/26/02
Fluorene	ND	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	ND	2.00		µg/L	1	3/26/02
Pyrene	ND	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	93.1	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	83.6	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	48.8	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	96.4	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	81.2	35-114		%REC	1	3/26/02
Surr: Phenol-d5	32.3	10-94		%REC	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-04A

Client Sample ID: Screen Rinse Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7	ND	0.00600		mg/L	1	3/26/02
Barium, 200.7	0.00600	0.00500		mg/L	1	3/26/02
Chromium, 200.7	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7	ND	0.00500		mg/L	1	3/26/02
Copper, 200.7	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7	0.997	0.0100		mg/L	1	3/26/02
Lead, 200.7	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7	0.121	0.0500		mg/L	1	3/26/02
Manganese, 200.7	0.0175	0.00500		mg/L	1	3/26/02
Nickel, 200.7	ND	0.00500		mg/L	1	3/26/02
Selenium, 200.7	ND	0.00500		mg/L	1	3/26/02
Silver, 200.7	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	0.101	0.0100		mg/L	1	3/26/02
Vanadium, 200.7	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7	0.0117	0.00500		mg/L	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-04A

Client Sample ID: Screen Rinse Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	ND	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-04A

Client Sample ID: Screen Rinse Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	ND	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	107.2	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	96.4	86-118		%REC	1	3/27/02
Surr: Toluene-d8	102.4	88-110		%REC	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-04A

Client Sample ID: Screen Rinse Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: **mrs**
Acenaphthene	ND	2.00		µg/L	1	3/26/02
Acenaphthylene	ND	2.00		µg/L	1	3/26/02
Anthracene	ND	2.00		µg/L	1	3/26/02
Benz(a)anthracene	ND	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	ND	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	ND	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	ND	2.00		µg/L	1	3/26/02
Fluorene	ND	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	ND	2.00		µg/L	1	3/26/02
Pyrene	ND	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	85.5	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	76.4	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	47.0	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	96.0	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	76.4	35-114		%REC	1	3/26/02
Surr: Phenol-d5	31.2	10-94		%REC	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-05A

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	ND	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-05A

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	ND	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	105.4	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	99.6	86-118		%REC	1	3/27/02
Surr: Toluene-d8	103.8	88-110		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-06A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	4.85	0.200		mg/L	5	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	0.00660	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	0.0983	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	0.00760	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	94.5	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	79.2	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	10.4	0.0100		mg/L	1	3/26/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	0.0141	0.00500		mg/L	1	3/26/02

Qualifiers:

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-06A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/27/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/27/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/27/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/27/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/27/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/27/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/27/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/27/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/27/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/27/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/27/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/27/02
2-Butanone	ND	20.0		µg/L	1	3/27/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/27/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
2-Hexanone	ND	20.0		µg/L	1	3/27/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/27/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/27/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/27/02
Acetone	ND	20.0		µg/L	1	3/27/02
Benzene	3.48	1.00		µg/L	1	3/27/02
Bromobenzene	ND	1.00		µg/L	1	3/27/02
Bromochloromethane	ND	1.00		µg/L	1	3/27/02
Bromodichloromethane	ND	1.00		µg/L	1	3/27/02
Bromoform	ND	1.00		µg/L	1	3/27/02
Bromomethane	ND	5.00		µg/L	1	3/27/02
Carbon disulfide	ND	1.00		µg/L	1	3/27/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/27/02
Chlorobenzene	ND	1.00		µg/L	1	3/27/02
Chloroethane	ND	5.00		µg/L	1	3/27/02
Chloroform	ND	1.00		µg/L	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-06A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/27/02
cis-1,2-Dichloroethene	88.9	1.00		µg/L	1	3/27/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Dibromochloromethane	ND	1.00		µg/L	1	3/27/02
Dibromomethane	ND	1.00		µg/L	1	3/27/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/27/02
Ethylbenzene	ND	1.00		µg/L	1	3/27/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/27/02
Iodomethane	ND	5.00		µg/L	1	3/27/02
Isopropylbenzene	ND	1.00		µg/L	1	3/27/02
m,p-Xylene	ND	2.00		µg/L	1	3/27/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/27/02
Methylene chloride	ND	20.0		µg/L	1	3/27/02
n-Butylbenzene	ND	1.00		µg/L	1	3/27/02
n-Propylbenzene	ND	1.00		µg/L	1	3/27/02
Naphthalene	ND	2.00		µg/L	1	3/27/02
o-Xylene	ND	1.00		µg/L	1	3/27/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Styrene	ND	1.00		µg/L	1	3/27/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/27/02
Tetrachloroethene	ND	1.00		µg/L	1	3/27/02
Toluene	ND	1.00		µg/L	1	3/27/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/27/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/27/02
Trichloroethene	ND	1.00		µg/L	1	3/27/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/27/02
Vinyl acetate	ND	1.00		µg/L	1	3/27/02
Vinyl chloride	2.30	1.20		µg/L	1	3/27/02
Surr: 4-Bromofluorobenzene	104.6	86-115		%REC	1	3/27/02
Surr: Dibromofluoromethane	91.0	86-118		%REC	1	3/27/02
Surr: Toluene-d8	102.2	88-110		%REC	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-06A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: **mrs**
Acenaphthene	ND	2.00		µg/L	1	3/26/02
Acenaphthylene	ND	2.00		µg/L	1	3/26/02
Anthracene	ND	2.00		µg/L	1	3/26/02
Benz(a)anthracene	ND	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	ND	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	ND	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	ND	2.00		µg/L	1	3/26/02
Fluorene	ND	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	ND	2.00		µg/L	1	3/26/02
Pyrene	ND	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	98.6	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	86.6	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	48.1	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	91.8	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	79.8	35-114		%REC	1	3/26/02
Surr: Phenol-d5	31.1	10-94		%REC	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-07A

Client Sample ID: Filter Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	ND	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	0.0748	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	0.0609	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	0.00820	0.00500		mg/L	1	3/26/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-08A

Client Sample ID: Still Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	4/1/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	4/1/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	4/1/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	4/1/02
1,1-Dichloroethane	ND	1.50		µg/L	1	4/1/02
1,1-Dichloroethene	ND	1.00		µg/L	1	4/1/02
1,1-Dichloropropene	ND	1.00		µg/L	1	4/1/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	4/1/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	4/1/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	4/1/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	4/1/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	4/1/02
1,2-Dibromoethane	ND	1.00		µg/L	1	4/1/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	4/1/02
1,2-Dichloroethane	ND	1.00		µg/L	1	4/1/02
1,2-Dichloropropane	ND	1.00		µg/L	1	4/1/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	4/1/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	4/1/02
1,3-Dichloropropane	ND	1.00		µg/L	1	4/1/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	4/1/02
2,2-Dichloropropane	ND	1.90		µg/L	1	4/1/02
2-Butanone	ND	20.0		µg/L	1	4/1/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	4/1/02
2-Chlorotoluene	ND	1.00		µg/L	1	4/1/02
2-Hexanone	ND	20.0		µg/L	1	4/1/02
4-Chlorotoluene	ND	1.00		µg/L	1	4/1/02
4-Isopropyltoluene	ND	1.00		µg/L	1	4/1/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	4/1/02
Acetone	ND	20.0		µg/L	1	4/1/02
Benzene	ND	1.00		µg/L	1	4/1/02
Bromobenzene	ND	1.00		µg/L	1	4/1/02
Bromochloromethane	ND	1.00		µg/L	1	4/1/02
Bromodichloromethane	ND	1.00		µg/L	1	4/1/02
Bromoform	ND	1.00		µg/L	1	4/1/02
Bromomethane	ND	5.00		µg/L	1	4/1/02
Carbon disulfide	ND	1.00		µg/L	1	4/1/02
Carbon tetrachloride	ND	1.00		µg/L	1	4/1/02
Chlorobenzene	ND	1.00		µg/L	1	4/1/02
Chloroethane	ND	5.00		µg/L	1	4/1/02
Chloroform	ND	1.00		µg/L	1	4/1/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-08A

Client Sample ID: Still Blank
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	4/1/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	4/1/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	4/1/02
Dibromochloromethane	ND	1.00		µg/L	1	4/1/02
Dibromomethane	ND	1.00		µg/L	1	4/1/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	4/1/02
Ethylbenzene	ND	1.00		µg/L	1	4/1/02
Hexachlorobutadiene	ND	2.00		µg/L	1	4/1/02
Iodomethane	ND	5.00		µg/L	1	4/1/02
Isopropylbenzene	ND	1.00		µg/L	1	4/1/02
m,p-Xylene	ND	2.00		µg/L	1	4/1/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	4/1/02
Methylene chloride	ND	20.0		µg/L	1	4/1/02
n-Butylbenzene	ND	1.00		µg/L	1	4/1/02
n-Propylbenzene	ND	1.00		µg/L	1	4/1/02
Naphthalene	ND	2.00		µg/L	1	4/1/02
o-Xylene	ND	1.00		µg/L	1	4/1/02
sec-Butylbenzene	ND	1.00		µg/L	1	4/1/02
Styrene	ND	1.00		µg/L	1	4/1/02
tert-Butylbenzene	ND	1.00		µg/L	1	4/1/02
Tetrachloroethene	ND	1.00		µg/L	1	4/1/02
Toluene	ND	1.00		µg/L	1	4/1/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	4/1/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	4/1/02
Trichloroethene	ND	1.00		µg/L	1	4/1/02
Trichlorofluoromethane	ND	2.00		µg/L	1	4/1/02
Vinyl acetate	ND	1.00		µg/L	1	4/1/02
Vinyl chloride	ND	1.20		µg/L	1	4/1/02
Surr: 4-Bromofluorobenzene	106.6	86-115		%REC	1	4/1/02
Surr: Dibromofluoromethane	105.4	86-118		%REC	1	4/1/02
Surr: Toluene-d8	101.6	88-110		%REC	1	4/1/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-09A

Client Sample ID: GP02-02 (23-27)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	4.04	0.200		mg/L	5	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Arsenic, 200.7 Diss	ND	0.00600		mg/L	1	3/26/02
Barium, 200.7 Diss	0.181	0.00500		mg/L	1	3/26/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Cobalt, 200.7 Diss	0.0456	0.00500		mg/L	1	3/26/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Iron, 200.7 Diss	75.6	0.0100		mg/L	1	3/26/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Magnesium, 200.7 Diss	44.9	0.0500		mg/L	1	3/26/02
Manganese, 200.7 Diss	12.4	0.0100		mg/L	1	3/26/02
Nickel, 200.7 Diss	0.0286	0.00500		mg/L	1	3/26/02
Selenium, 200.7 Diss	0.00640	0.00500		mg/L	1	3/26/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/26/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/26/02
Zinc, 200.7 Diss	0.0111	0.00500		mg/L	1	3/26/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-09A

Client Sample ID: GP02-02 (23-27)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1,000		µg/L	1000	4/1/02
1,1,1-Trichloroethane	ND	1,000		µg/L	1000	4/1/02
1,1,2,2-Tetrachloroethane	ND	1,000		µg/L	1000	4/1/02
1,1,2-Trichloroethane	ND	1,000		µg/L	1000	4/1/02
1,1-Dichloroethane	ND	1,500		µg/L	1000	4/1/02
1,1-Dichloroethene	ND	1,000		µg/L	1000	4/1/02
1,1-Dichloropropene	ND	1,000		µg/L	1000	4/1/02
1,2,3-Trichlorobenzene	ND	1,800		µg/L	1000	4/1/02
1,2,3-Trichloropropane	ND	1,000		µg/L	1000	4/1/02
1,2,4-Trichlorobenzene	ND	1,000		µg/L	1000	4/1/02
1,2,4-Trimethylbenzene	ND	1,000		µg/L	1000	4/1/02
1,2-Dibromo-3-chloropropane	ND	2,000		µg/L	1000	4/1/02
1,2-Dibromoethane	ND	1,000		µg/L	1000	4/1/02
1,2-Dichlorobenzene	ND	1,000		µg/L	1000	4/1/02
1,2-Dichloroethane	ND	1,000		µg/L	1000	4/1/02
1,2-Dichloropropane	ND	1,000		µg/L	1000	4/1/02
1,3,5-Trimethylbenzene	ND	1,000		µg/L	1000	4/1/02
1,3-Dichlorobenzene	ND	1,000		µg/L	1000	4/1/02
1,3-Dichloropropane	ND	1,000		µg/L	1000	4/1/02
1,4-Dichlorobenzene	ND	1,000		µg/L	1000	4/1/02
2,2-Dichloropropane	ND	1,900		µg/L	1000	4/1/02
2-Butanone	ND	20,000		µg/L	1000	4/1/02
2-Chloroethyl vinyl ether	ND	5,000		µg/L	1000	4/1/02
2-Chlorotoluene	ND	1,000		µg/L	1000	4/1/02
2-Hexanone	ND	20,000		µg/L	1000	4/1/02
4-Chlorotoluene	ND	1,000		µg/L	1000	4/1/02
4-Isopropyltoluene	ND	1,000		µg/L	1000	4/1/02
4-Methyl-2-pentanone	ND	1,000		µg/L	1000	4/1/02
Acetone	ND	20,000		µg/L	1000	4/1/02
Benzene	4,970	1,000		µg/L	1000	4/1/02
Bromobenzene	ND	1,000		µg/L	1000	4/1/02
Bromochloromethane	ND	1,000		µg/L	1000	4/1/02
Bromodichloromethane	ND	1,000		µg/L	1000	4/1/02
Bromoform	ND	1,000		µg/L	1000	4/1/02
Bromomethane	ND	5,000		µg/L	1000	4/1/02
Carbon disulfide	ND	1,000		µg/L	1000	4/1/02
Carbon tetrachloride	ND	1,000		µg/L	1000	4/1/02
Chlorobenzene	ND	1,000		µg/L	1000	4/1/02
Chloroethane	ND	5,000		µg/L	1000	4/1/02
Chloroform	ND	1,000		µg/L	1000	4/1/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-09A

Client Sample ID: GP02-02 (23-27)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2,000		µg/L	1000	4/1/02
cis-1,2-Dichloroethene	21,500	1,000		µg/L	1000	4/1/02
cis-1,3-Dichloropropene	ND	1,000		µg/L	1000	4/1/02
Dibromochloromethane	ND	1,000		µg/L	1000	4/1/02
Dibromomethane	ND	1,000		µg/L	1000	4/1/02
Dichlorodifluoromethane	ND	2,000		µg/L	1000	4/1/02
Ethylbenzene	ND	1,000		µg/L	1000	4/1/02
Hexachlorobutadiene	ND	2,000		µg/L	1000	4/1/02
Iodomethane	ND	5,000		µg/L	1000	4/1/02
Isopropylbenzene	ND	1,000		µg/L	1000	4/1/02
m,p-Xylene	ND	2,000		µg/L	1000	4/1/02
Methyl tert-butyl ether	ND	2,000		µg/L	1000	4/1/02
Methylene chloride	ND	20,000		µg/L	1000	4/1/02
n-Butylbenzene	ND	1,000		µg/L	1000	4/1/02
n-Propylbenzene	ND	1,000		µg/L	1000	4/1/02
Naphthalene	9,200	2,000		µg/L	1000	4/1/02
o-Xylene	ND	1,000		µg/L	1000	4/1/02
sec-Butylbenzene	ND	1,000		µg/L	1000	4/1/02
Styrene	ND	1,000		µg/L	1000	4/1/02
tert-Butylbenzene	ND	1,000		µg/L	1000	4/1/02
Tetrachloroethene	ND	1,000		µg/L	1000	4/1/02
Toluene	ND	1,000		µg/L	1000	4/1/02
trans-1,2-Dichloroethene	ND	1,000		µg/L	1000	4/1/02
trans-1,3-Dichloropropene	ND	1,000		µg/L	1000	4/1/02
Trichloroethene	ND	1,000		µg/L	1000	4/1/02
Trichlorofluoromethane	ND	2,000		µg/L	1000	4/1/02
Vinyl acetate	ND	1,000		µg/L	1000	4/1/02
Vinyl chloride	ND	1,200		µg/L	1000	4/1/02
Surr: 4-Bromofluorobenzene	104.8	86-115		%REC	1000	4/1/02
Surr: Dibromofluoromethane	103.6	86-118		%REC	1000	4/1/02
Surr: Toluene-d8	103.0	88-110		%REC	1000	4/1/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-09A

Client Sample ID: GP02-02 (23-27)
Tag Number:
Collection Date: 3/20/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
BNA SEMI-VOL ORGANICS, AQUEOUS		**EPA 8270C**				Analyst: **mrs**
Acenaphthene	62.4	2.00		µg/L	1	3/26/02
Acenaphthylene	167	2.00		µg/L	1	3/26/02
Anthracene	20.7	2.00		µg/L	1	3/26/02
Benz(a)anthracene	2.71	2.00		µg/L	1	3/26/02
Benzo(a)pyrene	2.48	2.00		µg/L	1	3/26/02
Benzo(b)fluoranthene	ND	2.00		µg/L	1	3/26/02
Benzo(g,h,i)perylene	ND	2.00		µg/L	1	3/26/02
Benzo(k)fluoranthene	ND	2.00		µg/L	1	3/26/02
Chrysene	3.63	2.00		µg/L	1	3/26/02
Dibenz(a,h)anthracene	ND	2.00		µg/L	1	3/26/02
Fluoranthene	17.6	2.00		µg/L	1	3/26/02
Fluorene	74.2	2.00		µg/L	1	3/26/02
Indeno(1,2,3-cd)pyrene	ND	2.00		µg/L	1	3/26/02
Naphthalene	ND	2.00		µg/L	1	3/26/02
Phenanthrene	139	2.00		µg/L	1	3/26/02
Pyrene	19.6	2.00		µg/L	1	3/26/02
Surr: 2,4,6-Tribromophenol	100.0	10-123		%REC	1	3/26/02
Surr: 2-Fluorobiphenyl	98.4	43-116		%REC	1	3/26/02
Surr: 2-Fluorophenol	55.4	21-100		%REC	1	3/26/02
Surr: 4-Terphenyl-d14	91.6	33-141		%REC	1	3/26/02
Surr: Nitrobenzene-d5	98.8	35-114		%REC	1	3/26/02
Surr: Phenol-d5	34.7	10-94		%REC	1	3/26/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-10A

Client Sample ID: GP02-02 (2-4)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	0.102	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	1.05	1.00		mg/Kg	1	3/22/02
Arsenic	3.92	1.00		mg/Kg	1	3/22/02
Barium	117	1.00		mg/Kg	1	3/22/02
Chromium	23.8	1.00		mg/Kg	1	3/22/02
Cobalt	14.0	1.00		mg/Kg	1	3/22/02
Copper	31.5	1.00		mg/Kg	1	3/22/02
Iron	30,400	4.00		mg/Kg	1	3/22/02
Lead	17.5	1.00		mg/Kg	1	3/22/02
Magnesium	4,130	10.0		mg/Kg	1	3/22/02
Manganese	568	1.00		mg/Kg	1	3/22/02
Nickel	17.9	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,300	1.00		mg/Kg	1	3/22/02
Vanadium	73.9	1.00		mg/Kg	1	3/22/02
Zinc	128	1.00		mg/Kg	1	3/22/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-10A

Client Sample ID: GP02-02 (2-4)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	2	3/28/02
1,1,1-Trichloroethane	ND	10.0		µg/Kg	2	3/28/02
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	2	3/28/02
1,1,2-Trichloroethane	ND	10.0		µg/Kg	2	3/28/02
1,1-Dichloroethane	ND	10.0		µg/Kg	2	3/28/02
1,1-Dichloroethene	ND	10.0		µg/Kg	2	3/28/02
1,1-Dichloropropene	ND	10.0		µg/Kg	2	3/28/02
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	2	3/28/02
1,2,3-Trichloropropane	ND	10.0		µg/Kg	2	3/28/02
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	2	3/28/02
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	2	3/28/02
1,2-Dibromo-3-chloropropane	ND	20.0		µg/Kg	2	3/28/02
1,2-Dibromoethane	ND	10.0		µg/Kg	2	3/28/02
1,2-Dichlorobenzene	ND	10.0		µg/Kg	2	3/28/02
1,2-Dichloroethane	ND	10.0		µg/Kg	2	3/28/02
1,2-Dichloropropane	ND	10.0		µg/Kg	2	3/28/02
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	2	3/28/02
1,3-Dichlorobenzene	ND	10.0		µg/Kg	2	3/28/02
1,3-Dichloropropane	ND	10.0		µg/Kg	2	3/28/02
1,4-Dichlorobenzene	ND	10.0		µg/Kg	2	3/28/02
2,2-Dichloropropane	ND	10.0		µg/Kg	2	3/28/02
2-Butanone	ND	200		µg/Kg	2	3/28/02
2-Chloroethyl vinyl ether	ND	100		µg/Kg	2	3/28/02
2-Chlorotoluene	ND	10.0		µg/Kg	2	3/28/02
2-Hexanone	ND	200		µg/Kg	2	3/28/02
4-Chlorotoluene	ND	10.0		µg/Kg	2	3/28/02
4-Isopropyltoluene	ND	10.0		µg/Kg	2	3/28/02
4-Methyl-2-pentanone	ND	10.0		µg/Kg	2	3/28/02
Acetone	ND	200		µg/Kg	2	3/28/02
Benzene	ND	10.0		µg/Kg	2	3/28/02
Bromobenzene	ND	10.0		µg/Kg	2	3/28/02
Bromochloromethane	ND	10.0		µg/Kg	2	3/28/02
Bromodichloromethane	ND	10.0		µg/Kg	2	3/28/02
Bromoform	ND	10.0		µg/Kg	2	3/28/02
Bromomethane	ND	20.0		µg/Kg	2	3/28/02
Carbon disulfide	ND	10.0		µg/Kg	2	3/28/02
Carbon tetrachloride	ND	10.0		µg/Kg	2	3/28/02
Chlorobenzene	ND	10.0		µg/Kg	2	3/28/02
Chloroethane	ND	20.0		µg/Kg	2	3/28/02
Chloroform	ND	10.0		µg/Kg	2	3/28/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-10A

Client Sample ID: GP02-02 (2-4)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	20.0		µg/Kg	2	3/28/02
cis-1,2-Dichloroethene	42.2	10.0		µg/Kg	2	3/28/02
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	2	3/28/02
Dibromochloromethane	ND	10.0		µg/Kg	2	3/28/02
Dibromomethane	ND	10.0		µg/Kg	2	3/28/02
Dichlorodifluoromethane	ND	20.0		µg/Kg	2	3/28/02
Ethylbenzene	ND	10.0		µg/Kg	2	3/28/02
Hexachlorobutadiene	ND	10.0		µg/Kg	2	3/28/02
Iodomethane	ND	10.0		µg/Kg	2	3/28/02
Isopropylbenzene	ND	10.0		µg/Kg	2	3/28/02
m,p-Xylene	ND	20.0		µg/Kg	2	3/28/02
Methyl tert-butyl ether	ND	20.0		µg/Kg	2	3/28/02
Methylene chloride	ND	200		µg/Kg	2	3/28/02
n-Butylbenzene	ND	10.0		µg/Kg	2	3/28/02
n-Propylbenzene	ND	10.0		µg/Kg	2	3/28/02
Naphthalene	64.2	20.0		µg/Kg	2	3/28/02
o-Xylene	ND	10.0		µg/Kg	2	3/28/02
sec-Butylbenzene	ND	10.0		µg/Kg	2	3/28/02
Styrene	ND	10.0		µg/Kg	2	3/28/02
tert-Butylbenzene	ND	10.0		µg/Kg	2	3/28/02
Tetrachloroethene	ND	10.0		µg/Kg	2	3/28/02
Toluene	ND	10.0		µg/Kg	2	3/28/02
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	2	3/28/02
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	2	3/28/02
Trichloroethene	ND	10.0		µg/Kg	2	3/28/02
Trichlorofluoromethane	ND	20.0		µg/Kg	2	3/28/02
Vinyl acetate	ND	10.0		µg/Kg	2	3/28/02
Vinyl chloride	ND	20.0		µg/Kg	2	3/28/02
Surr: 4-Bromofluorobenzene	105.0	74-121		%REC	2	3/28/02
Surr: Dibromofluoromethane	89.6	80-120		%REC	2	3/28/02
Surr: Toluene-d8	103.6	81-117		%REC	2	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-10A

Client Sample ID: GP02-02 (2-4)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	50.0		µg/Kg	1	3/25/02
Acenaphthylene	ND	50.0		µg/Kg	1	3/25/02
Anthracene	ND	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	80.0	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	75.0	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	55.0	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	65.0	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	60.0	50.0		µg/Kg	1	3/25/02
Chrysene	110	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	3/25/02
Fluoranthene	160	50.0		µg/Kg	1	3/25/02
Fluorene	ND	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	55.0	50.0		µg/Kg	1	3/25/02
Naphthalene	110	50.0		µg/Kg	1	3/25/02
Phenanthrene	95.0	50.0		µg/Kg	1	3/25/02
Pyrene	150	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	114.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	136.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	119.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-11A

Client Sample ID: GP02-02 (18-20)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	0.342	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	2.42	1.00		mg/Kg	1	3/22/02
Barium	92.3	1.00		mg/Kg	1	3/22/02
Chromium	13.5	1.00		mg/Kg	1	3/22/02
Cobalt	13.1	1.00		mg/Kg	1	3/22/02
Copper	14.2	1.00		mg/Kg	1	3/22/02
Iron	32,300	4.00		mg/Kg	1	3/22/02
Lead	4.12	1.00		mg/Kg	1	3/22/02
Magnesium	3,020	10.0		mg/Kg	1	3/22/02
Manganese	290	1.00		mg/Kg	1	3/22/02
Nickel	14.6	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,580	1.00		mg/Kg	1	3/22/02
Vanadium	69.0	1.00		mg/Kg	1	3/22/02
Zinc	52.4	1.00		mg/Kg	1	3/22/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-11A

Client Sample ID: GP02-02 (18-20)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	20.0		µg/Kg	4	3/29/02
1,1,1-Trichloroethane	ND	20.0		µg/Kg	4	3/29/02
1,1,2,2-Tetrachloroethane	ND	20.0		µg/Kg	4	3/29/02
1,1,2-Trichloroethane	ND	20.0		µg/Kg	4	3/29/02
1,1-Dichloroethane	ND	20.0		µg/Kg	4	3/29/02
1,1-Dichloroethene	ND	20.0		µg/Kg	4	3/29/02
1,1-Dichloropropene	ND	20.0		µg/Kg	4	3/29/02
1,2,3-Trichlorobenzene	ND	20.0		µg/Kg	4	3/29/02
1,2,3-Trichloropropane	ND	20.0		µg/Kg	4	3/29/02
1,2,4-Trichlorobenzene	ND	20.0		µg/Kg	4	3/29/02
1,2,4-Trimethylbenzene	ND	20.0		µg/Kg	4	3/29/02
1,2-Dibromo-3-chloropropane	ND	40.0		µg/Kg	4	3/29/02
1,2-Dibromoethane	ND	20.0		µg/Kg	4	3/29/02
1,2-Dichlorobenzene	ND	20.0		µg/Kg	4	3/29/02
1,2-Dichloroethane	ND	20.0		µg/Kg	4	3/29/02
1,2-Dichloropropane	ND	20.0		µg/Kg	4	3/29/02
1,3,5-Trimethylbenzene	ND	20.0		µg/Kg	4	3/29/02
1,3-Dichlorobenzene	ND	20.0		µg/Kg	4	3/29/02
1,3-Dichloropropane	ND	20.0		µg/Kg	4	3/29/02
1,4-Dichlorobenzene	ND	20.0		µg/Kg	4	3/29/02
2,2-Dichloropropane	ND	20.0		µg/Kg	4	3/29/02
2-Butanone	ND	400		µg/Kg	4	3/29/02
2-Chloroethyl vinyl ether	ND	200		µg/Kg	4	3/29/02
2-Chlorotoluene	ND	20.0		µg/Kg	4	3/29/02
2-Hexanone	ND	400		µg/Kg	4	3/29/02
4-Chlorotoluene	ND	20.0		µg/Kg	4	3/29/02
4-Isopropyltoluene	ND	20.0		µg/Kg	4	3/29/02
4-Methyl-2-pentanone	ND	20.0		µg/Kg	4	3/29/02
Acetone	ND	400		µg/Kg	4	3/29/02
Benzene	ND	20.0		µg/Kg	4	3/29/02
Bromobenzene	ND	20.0		µg/Kg	4	3/29/02
Bromochloromethane	ND	20.0		µg/Kg	4	3/29/02
Bromodichloromethane	ND	20.0		µg/Kg	4	3/29/02
Bromoform	ND	20.0		µg/Kg	4	3/29/02
Bromomethane	ND	40.0		µg/Kg	4	3/29/02
Carbon disulfide	ND	20.0		µg/Kg	4	3/29/02
Carbon tetrachloride	ND	20.0		µg/Kg	4	3/29/02
Chlorobenzene	ND	20.0		µg/Kg	4	3/29/02
Chloroethane	ND	40.0		µg/Kg	4	3/29/02
Chloroform	ND	20.0		µg/Kg	4	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-11A

Client Sample ID: GP02-02 (18-20)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	40.0		µg/Kg	4	3/29/02
cis-1,2-Dichloroethene	64.4	20.0		µg/Kg	4	3/29/02
cis-1,3-Dichloropropene	ND	20.0		µg/Kg	4	3/29/02
Dibromochloromethane	ND	20.0		µg/Kg	4	3/29/02
Dibromomethane	ND	20.0		µg/Kg	4	3/29/02
Dichlorodifluoromethane	ND	40.0		µg/Kg	4	3/29/02
Ethylbenzene	ND	20.0		µg/Kg	4	3/29/02
Hexachlorobutadiene	ND	20.0		µg/Kg	4	3/29/02
Iodomethane	ND	20.0		µg/Kg	4	3/29/02
Isopropylbenzene	ND	20.0		µg/Kg	4	3/29/02
m,p-Xylene	ND	40.0		µg/Kg	4	3/29/02
Methyl tert-butyl ether	ND	40.0		µg/Kg	4	3/29/02
Methylene chloride	ND	400		µg/Kg	4	3/29/02
n-Butylbenzene	ND	20.0		µg/Kg	4	3/29/02
n-Propylbenzene	ND	20.0		µg/Kg	4	3/29/02
Naphthalene	428	40.0		µg/Kg	4	3/29/02
o-Xylene	ND	20.0		µg/Kg	4	3/29/02
sec-Butylbenzene	ND	20.0		µg/Kg	4	3/29/02
Styrene	ND	20.0		µg/Kg	4	3/29/02
tert-Butylbenzene	ND	20.0		µg/Kg	4	3/29/02
Tetrachloroethene	ND	20.0		µg/Kg	4	3/29/02
Toluene	ND	20.0		µg/Kg	4	3/29/02
trans-1,2-Dichloroethene	ND	20.0		µg/Kg	4	3/29/02
trans-1,3-Dichloropropene	ND	20.0		µg/Kg	4	3/29/02
Trichloroethene	1,970	20.0		µg/Kg	4	3/29/02
Trichlorofluoromethane	ND	40.0		µg/Kg	4	3/29/02
Vinyl acetate	ND	20.0		µg/Kg	4	3/29/02
Vinyl chloride	ND	40.0		µg/Kg	4	3/29/02
Surr: 4-Bromofluorobenzene	106.6	74-121		%REC	4	3/29/02
Surr: Dibromofluoromethane	102.2	80-120		%REC	4	3/29/02
Surr: Toluene-d8	104.4	81-117		%REC	4	3/29/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-11A

Client Sample ID: GP02-02 (18-20)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	50.0		µg/Kg	1	3/25/02
Acenaphthylene	50	50.0		µg/Kg	1	3/25/02
Anthracene	75.0	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	275	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	440	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	235	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	405	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	270	50.0		µg/Kg	1	3/25/02
Chrysene	395	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	70.0	50.0		µg/Kg	1	3/25/02
Fluoranthene	675	50.0		µg/Kg	1	3/25/02
Fluorene	ND	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	285	50.0		µg/Kg	1	3/25/02
Naphthalene	ND	50.0		µg/Kg	1	3/25/02
Phenanthrene	160	50.0		µg/Kg	1	3/25/02
Pyrene	690	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	114.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	120.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	111.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-12A

Client Sample ID: GP02-02 (23-25)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	1.84	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	2.77	1.00		mg/Kg	1	3/22/02
Barium	118	1.00		mg/Kg	1	3/22/02
Chromium	20.5	1.00		mg/Kg	1	3/22/02
Cobalt	11.4	1.00		mg/Kg	1	3/22/02
Copper	18.2	1.00		mg/Kg	1	3/22/02
Iron	29,200	4.00		mg/Kg	1	3/22/02
Lead	2.45	1.00		mg/Kg	1	3/22/02
Magnesium	3,290	10.0		mg/Kg	1	3/22/02
Manganese	150	1.00		mg/Kg	1	3/22/02
Nickel	27.4	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,450	1.00		mg/Kg	1	3/22/02
Vanadium	74.0	1.00		mg/Kg	1	3/22/02
Zinc	40.8	1.00		mg/Kg	1	3/22/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-12A

Client Sample ID: GP02-02 (23-25)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	1,000		µg/Kg	200	3/29/02
1,1,1-Trichloroethane	ND	1,000		µg/Kg	200	3/29/02
1,1,2,2-Tetrachloroethane	ND	1,000		µg/Kg	200	3/29/02
1,1,2-Trichloroethane	ND	1,000		µg/Kg	200	3/29/02
1,1-Dichloroethane	ND	1,000		µg/Kg	200	3/29/02
1,1-Dichloroethene	ND	1,000		µg/Kg	200	3/29/02
1,1-Dichloropropene	ND	1,000		µg/Kg	200	3/29/02
1,2,3-Trichlorobenzene	ND	1,000		µg/Kg	200	3/29/02
1,2,3-Trichloropropane	ND	1,000		µg/Kg	200	3/29/02
1,2,4-Trichlorobenzene	ND	1,000		µg/Kg	200	3/29/02
1,2,4-Trimethylbenzene	6,380	1,000		µg/Kg	200	3/29/02
1,2-Dibromo-3-chloropropane	ND	2,000		µg/Kg	200	3/29/02
1,2-Dibromoethane	ND	1,000		µg/Kg	200	3/29/02
1,2-Dichlorobenzene	ND	1,000		µg/Kg	200	3/29/02
1,2-Dichloroethane	ND	1,000		µg/Kg	200	3/29/02
1,2-Dichloropropane	ND	1,000		µg/Kg	200	3/29/02
1,3,5-Trimethylbenzene	1,850	1,000		µg/Kg	200	3/29/02
1,3-Dichlorobenzene	ND	1,000		µg/Kg	200	3/29/02
1,3-Dichloropropane	ND	1,000		µg/Kg	200	3/29/02
1,4-Dichlorobenzene	ND	1,000		µg/Kg	200	3/29/02
2,2-Dichloropropane	ND	1,000		µg/Kg	200	3/29/02
2-Butanone	ND	20,000		µg/Kg	200	3/29/02
2-Chloroethyl vinyl ether	ND	10,000		µg/Kg	200	3/29/02
2-Chlorotoluene	ND	1,000		µg/Kg	200	3/29/02
2-Hexanone	ND	20,000		µg/Kg	200	3/29/02
4-Chlorotoluene	ND	1,000		µg/Kg	200	3/29/02
4-Isopropyltoluene	ND	1,000		µg/Kg	200	3/29/02
4-Methyl-2-pentanone	ND	1,000		µg/Kg	200	3/29/02
Acetone	ND	20,000		µg/Kg	200	3/29/02
Benzene	1,440	1,000		µg/Kg	200	3/29/02
Bromobenzene	ND	1,000		µg/Kg	200	3/29/02
Bromochloromethane	ND	1,000		µg/Kg	200	3/29/02
Bromodichloromethane	ND	1,000		µg/Kg	200	3/29/02
Bromoform	ND	1,000		µg/Kg	200	3/29/02
Bromomethane	ND	2,000		µg/Kg	200	3/29/02
Carbon disulfide	ND	1,000		µg/Kg	200	3/29/02
Carbon tetrachloride	ND	1,000		µg/Kg	200	3/29/02
Chlorobenzene	ND	1,000		µg/Kg	200	3/29/02
Chloroethane	ND	2,000		µg/Kg	200	3/29/02
Chloroform	ND	1,000		µg/Kg	200	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-12A

Client Sample ID: GP02-02 (23-25)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2,000		µg/Kg	200	3/29/02
cis-1,2-Dichloroethene	ND	1,000		µg/Kg	200	3/29/02
cis-1,3-Dichloropropene	ND	1,000		µg/Kg	200	3/29/02
Dibromochloromethane	ND	1,000		µg/Kg	200	3/29/02
Dibromomethane	ND	1,000		µg/Kg	200	3/29/02
Dichlorodifluoromethane	ND	2,000		µg/Kg	200	3/29/02
Ethylbenzene	4,300	1,000		µg/Kg	200	3/29/02
Hexachlorobutadiene	ND	1,000		µg/Kg	200	3/29/02
Iodomethane	ND	1,000		µg/Kg	200	3/29/02
Isopropylbenzene	ND	1,000		µg/Kg	200	3/29/02
m,p-Xylene	6,400	2,000		µg/Kg	200	3/29/02
Methyl tert-butyl ether	ND	2,000		µg/Kg	200	3/29/02
Methylene chloride	ND	20,000		µg/Kg	200	3/29/02
n-Butylbenzene	ND	1,000		µg/Kg	200	3/29/02
n-Propylbenzene	ND	1,000		µg/Kg	200	3/29/02
Naphthalene	468,000	40,000		µg/Kg	200	3/29/02
o-Xylene	3,000	1,000		µg/Kg	200	3/29/02
sec-Butylbenzene	ND	1,000		µg/Kg	200	3/29/02
Styrene	ND	1,000		µg/Kg	200	3/29/02
tert-Butylbenzene	ND	1,000		µg/Kg	200	3/29/02
Tetrachloroethene	ND	1,000		µg/Kg	200	3/29/02
Toluene	4,500	1,000		µg/Kg	200	3/29/02
trans-1,2-Dichloroethene	ND	1,000		µg/Kg	200	3/29/02
trans-1,3-Dichloropropene	ND	1,000		µg/Kg	200	3/29/02
Trichloroethene	ND	1,000		µg/Kg	200	3/29/02
Trichlorofluoromethane	ND	2,000		µg/Kg	200	3/29/02
Vinyl acetate	ND	1,000		µg/Kg	200	3/29/02
Vinyl chloride	ND	2,000		µg/Kg	200	3/29/02
Surr: 4-Bromofluorobenzene	100.4	74-121		%REC	200	3/29/02
Surr: Dibromofluoromethane	105.4	80-120		%REC	200	3/29/02
Surr: Toluene-d8	105.0	81-117		%REC	200	3/29/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
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* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-12A

Client Sample ID: GP02-02 (23-25)
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	3,050	50.0		µg/Kg	1	3/25/02
Acenaphthylene	3,750	50.0		µg/Kg	1	3/25/02
Anthracene	4,450	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	3,480	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	3,290	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	1,840	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	2,360	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	1,880	50.0		µg/Kg	1	3/25/02
Chrysene	4,440	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	410	50.0		µg/Kg	1	3/25/02
Fluoranthene	8,850	50.0		µg/Kg	1	3/25/02
Fluorene	4,000	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	1,740	50.0		µg/Kg	1	3/25/02
Naphthalene	34,200	50.0		µg/Kg	1	3/25/02
Phenanthrene	21,000	50.0		µg/Kg	1	3/25/02
Pyrene	10,800	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	128.0	30-115	S, MI	%REC	1	3/25/02
Surr: 4-Terphenyl-d14	125.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	120.0	23-120		%REC	1	3/25/02

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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-13A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/22/02
Arsenic	2.22	1.00		mg/Kg	1	3/22/02
Barium	64.9	1.00		mg/Kg	1	3/22/02
Chromium	12.3	1.00		mg/Kg	1	3/22/02
Cobalt	12.6	1.00		mg/Kg	1	3/22/02
Copper	12.3	1.00		mg/Kg	1	3/22/02
Iron	22,600	4.00		mg/Kg	1	3/22/02
Lead	3.55	1.00		mg/Kg	1	3/22/02
Magnesium	2,900	10.0		mg/Kg	1	3/22/02
Manganese	230	1.00		mg/Kg	1	3/22/02
Nickel	13.6	1.00		mg/Kg	1	3/22/02
Selenium	ND	1.00		mg/Kg	1	3/22/02
Silver	ND	1.00		mg/Kg	1	3/22/02
Titanium	1,480	1.00		mg/Kg	1	3/22/02
Vanadium	62.0	1.00		mg/Kg	1	3/22/02
Zinc	41.4	1.00		mg/Kg	1	3/22/02

Qualifiers:

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R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-13A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,1-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	3/29/02
1,2-Dibromoethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,4-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
2,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
2-Butanone	ND	100		µg/Kg	1	3/29/02
2-Chloroethyl vinyl ether	ND	50.0		µg/Kg	1	3/29/02
2-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
2-Hexanone	ND	100		µg/Kg	1	3/29/02
4-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
4-Isopropyltoluene	ND	5.00		µg/Kg	1	3/29/02
4-Methyl-2-pentanone	ND	5.00		µg/Kg	1	3/29/02
Acetone	ND	100		µg/Kg	1	3/29/02
Benzene	ND	5.00		µg/Kg	1	3/29/02
Bromobenzene	ND	5.00		µg/Kg	1	3/29/02
Bromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromodichloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromoform	ND	5.00		µg/Kg	1	3/29/02
Bromomethane	ND	10.0		µg/Kg	1	3/29/02
Carbon disulfide	ND	5.00		µg/Kg	1	3/29/02
Carbon tetrachloride	ND	5.00		µg/Kg	1	3/29/02
Chlorobenzene	ND	5.00		µg/Kg	1	3/29/02
Chloroethane	ND	10.0		µg/Kg	1	3/29/02
Chloroform	ND	5.00		µg/Kg	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-13A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	10.0		µg/Kg	1	3/29/02
cis-1,2-Dichloroethene	41.1	5.00		µg/Kg	1	3/29/02
cis-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Dibromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Dibromomethane	ND	5.00		µg/Kg	1	3/29/02
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	3/29/02
Ethylbenzene	ND	5.00		µg/Kg	1	3/29/02
Hexachlorobutadiene	ND	5.00		µg/Kg	1	3/29/02
Iodomethane	ND	5.00		µg/Kg	1	3/29/02
Isopropylbenzene	ND	5.00		µg/Kg	1	3/29/02
m,p-Xylene	ND	10.0		µg/Kg	1	3/29/02
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	3/29/02
Methylene chloride	ND	100		µg/Kg	1	3/29/02
n-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
n-Propylbenzene	ND	5.00		µg/Kg	1	3/29/02
Naphthalene	99.0	10.0		µg/Kg	1	3/29/02
o-Xylene	ND	5.00		µg/Kg	1	3/29/02
sec-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Styrene	ND	5.00		µg/Kg	1	3/29/02
tert-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Tetrachloroethene	ND	5.00		µg/Kg	1	3/29/02
Toluene	ND	5.00		µg/Kg	1	3/29/02
trans-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
trans-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Trichloroethene	16.4	5.00		µg/Kg	1	3/29/02
Trichlorofluoromethane	ND	10.0		µg/Kg	1	3/29/02
Vinyl acetate	ND	5.00		µg/Kg	1	3/29/02
Vinyl chloride	ND	10.0		µg/Kg	1	3/29/02
Surr: 4-Bromofluorobenzene	109.4	74-121		%REC	1	3/29/02
Surr: Dibromofluoromethane	82.2	80-120		%REC	1	3/29/02
Surr: Toluene-d8	106.4	81-117		%REC	1	3/29/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203193
Project: PDX WAC/ Wacker Siltronics
Lab ID: 0203193-13A

Client Sample ID: Duplicate
Tag Number:
Collection Date: 3/20/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	50.0		µg/Kg	1	3/25/02
Acenaphthylene	75.0	50.0		µg/Kg	1	3/25/02
Anthracene	175	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	220	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	285	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	140	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	245	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	190	50.0		µg/Kg	1	3/25/02
Chrysene	310	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	3/25/02
Fluoranthene	665	50.0		µg/Kg	1	3/25/02
Fluorene	65.0	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	170	50.0		µg/Kg	1	3/25/02
Naphthalene	55.0	50.0		µg/Kg	1	3/25/02
Phenanthrene	735	50.0		µg/Kg	1	3/25/02
Pyrene	625	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	113.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	113.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	100.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203193** Run ID: **HIT MAN_020322B** SeqNo: **112916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Sample ID: **MBlank** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **HIT MAN_020326A** SeqNo: **113193**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011717

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-3/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020327A** SeqNo: **113580**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	51.4	0	50	0	102.8%	86	115	0
Dibromofluoromethane	52.9	0	50	0	105.8%	86	118	0
Toluene-d8	50.1	0	50	0	100.2%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020401A** SeqNo: **114077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	55.8	0	50	0	111.6%	86	115	0
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0
Toluene-d8	51.4	0	50	0	102.8%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020330A** SeqNo: **114149**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	51.1	0	50	0	102.2%	86	115	0
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0
Toluene-d8	49.7	0	50	0	99.4%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113845**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5									
1,1,1-Trichloroethane	ND	5									
1,1,2,2-Tetrachloroethane	ND	5									
1,1,2-Trichloroethane	ND	5									
1,1-Dichloroethane	ND	5									
1,1-Dichloroethene	ND	5									
1,1-Dichloropropene	ND	5									
1,2,3-Trichlorobenzene	ND	5									
1,2,3-Trichloropropane	ND	5									
1,2,4-Trichlorobenzene	ND	5									
1,2,4-Trimethylbenzene	ND	5									
1,2-Dibromo-3-chloropropane	ND	10									
1,2-Dibromoethane	ND	5									
1,2-Dichlorobenzene	ND	5									
1,2-Dichloroethane	ND	5									
1,2-Dichloropropane	ND	5									
1,3,5-Trimethylbenzene	ND	5									
1,3-Dichlorobenzene	ND	5									
1,3-Dichloropropane	ND	5									
1,4-Dichlorobenzene	ND	5									
2,2-Dichloropropane	ND	5									
2-Butanone	ND	100									
2-Chloroethyl vinyl ether	ND	50									
2-Chlorotoluene	ND	5									
2-Hexanone	ND	100									
4-Chlorotoluene	ND	5									
4-Isopropyltoluene	ND	5									
4-Methyl-2-pentanone	ND	5									
Acetone	ND	100									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	5
Bromobenzene	ND	5
Bromochloromethane	ND	5
Bromodichloromethane	ND	5
Bromoform	ND	5
Bromomethane	ND	10
Carbon disulfide	ND	5
Carbon tetrachloride	ND	5
Chlorobenzene	ND	5
Chloroethane	ND	10
Chloroform	ND	5
Chloromethane	ND	10
cis-1,2-Dichloroethene	ND	5
cis-1,3-Dichloropropene	ND	5
Dibromochloromethane	ND	5
Dibromomethane	ND	5
Dichlorodifluoromethane	ND	10
Ethylbenzene	ND	5
Hexachlorobutadiene	ND	5
Iodomethane	ND	5
Isopropylbenzene	ND	5
m,p-Xylene	ND	10
Methyl tert-butyl ether	ND	10
Methylene chloride	ND	100
n-Butylbenzene	ND	5
n-Propylbenzene	ND	5
Naphthalene	ND	10
o-Xylene	ND	5
sec-Butylbenzene	ND	5
Styrene	ND	5
tert-Butylbenzene	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	5						
trans-1,3-Dichloropropene	ND	5						
Trichloroethene	ND	5						
Trichlorofluoromethane	ND	10						
Vinyl acetate	ND	5						
Vinyl chloride	ND	10						
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0
Dibromofluoromethane	54.7	0	50	0	109.4%	86	118	0
Toluene-d8	51.9	0	50	0	103.8%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020329A** SeqNo: **113945**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5									
1,1,1-Trichloroethane	ND	5									
1,1,2,2-Tetrachloroethane	ND	5									
1,1,2-Trichloroethane	ND	5									
1,1-Dichloroethane	ND	5									
1,1-Dichloroethene	ND	5									
1,1-Dichloropropene	ND	5									
1,2,3-Trichlorobenzene	ND	5									
1,2,3-Trichloropropane	ND	5									
1,2,4-Trichlorobenzene	ND	5									
1,2,4-Trimethylbenzene	ND	5									
1,2-Dibromo-3-chloropropane	ND	10									
1,2-Dibromoethane	ND	5									
1,2-Dichlorobenzene	ND	5									
1,2-Dichloroethane	ND	5									
1,2-Dichloropropane	ND	5									
1,3,5-Trimethylbenzene	ND	5									
1,3-Dichlorobenzene	ND	5									
1,3-Dichloropropane	ND	5									
1,4-Dichlorobenzene	ND	5									
2,2-Dichloropropane	ND	5									
2-Butanone	ND	100									
2-Chloroethyl vinyl ether	ND	50									
2-Chlorotoluene	ND	5									
2-Hexanone	ND	100									
4-Chlorotoluene	ND	5									
4-Isopropyltoluene	ND	5									
4-Methyl-2-pentanone	ND	5									
Acetone	ND	100									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	5
Bromobenzene	ND	5
Bromochloromethane	ND	5
Bromodichloromethane	ND	5
Bromoform	ND	5
Bromomethane	ND	10
Carbon disulfide	ND	5
Carbon tetrachloride	ND	5
Chlorobenzene	ND	5
Chloroethane	ND	10
Chloroform	ND	5
Chloromethane	ND	10
cis-1,2-Dichloroethene	ND	5
cis-1,3-Dichloropropene	ND	5
Dibromochloromethane	ND	5
Dibromomethane	ND	5
Dichlorodifluoromethane	ND	10
Ethylbenzene	ND	5
Hexachlorobutadiene	ND	5
Iodomethane	ND	5
Isopropylbenzene	ND	5
m,p-Xylene	ND	10
Methyl tert-butyl ether	ND	10
Methylene chloride	ND	100
n-Butylbenzene	ND	5
n-Propylbenzene	ND	5
Naphthalene	ND	10
o-Xylene	ND	5
sec-Butylbenzene	ND	5
Styrene	ND	5
tert-Butylbenzene	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	5						
trans-1,3-Dichloropropene	ND	5						
Trichloroethene	ND	5						
Trichlorofluoromethane	ND	10						
Vinyl acetate	ND	5						
Vinyl chloride	ND	10						
4-Bromofluorobenzene	55	0	50	0	110.0%	86	115	0
Dibromofluoromethane	56	0	50	0	112.0%	86	118	0
Toluene-d8	54	0	50	0	108.0%	88	110	0

Sample ID: **MB-4027** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**

Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112904**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Barium	ND	1									
Chromium	ND	1									
Cobalt	ND	1									
Copper	ND	1									
Iron	ND	2									
Lead	ND	1									
Magnesium	ND	10									
Manganese	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Titanium	ND	1									
Vanadium	ND	1									
Zinc	ND	1									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-4029** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113247**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4,5-Tetrachlorobenzene	ND	2									
1,2,4-Trichlorobenzene	ND	2									
1,2-Dichlorobenzene	ND	2									
1,2-Diphenylhydrazine	ND	2									
1,3-Dichlorobenzene	ND	2									
1,4-Dichlorobenzene	ND	2									
2,3,4,6-Tetrachlorophenol	ND	2									
2,4,5-Trichlorophenol	ND	2									
2,4,6-Trichlorophenol	ND	2									
2,4-Dichlorophenol	ND	2									
2,4-Dimethylphenol	ND	2									
2,4-Dinitrophenol	ND	10									
2,4-Dinitrotoluene	ND	2									
2,6-Dichlorophenol	ND	2									
2,6-Dinitrotoluene	ND	2									
2-Chloronaphthalene	ND	2									
2-Chlorophenol	ND	2									
2-Methylnaphthalene	ND	2									
2-Methylphenol	ND	2									
2-Nitroaniline	ND	2									
2-Nitrophenol	ND	2									
3&4-Methylphenol	ND	4									
3-Methylcholanthrene	ND	2									
3-Nitroaniline	ND	2									
4,6-Dinitro-2-methylphenol	ND	2									
4-Aminobiphenyl	ND	2									
4-Bromophenyl phenyl ether	ND	2									
4-Chloro-3-methylphenol	ND	2									
4-Chlorophenyl phenyl ether	ND	2									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

4-Nitroaniline	ND	2
4-Nitrophenol	ND	2
7,12-Dimethylbenz(a)anthracene	ND	2
Acenaphthene	ND	2
Acenaphthylene	ND	2
Acetophenone	ND	4
Aniline	ND	2
Anthracene	ND	2
Benz(a)anthracene	ND	2
Benzo(a)pyrene	ND	2
Benzo(b)fluoranthene	ND	2
Benzo(g,h,i)perylene	ND	2
Benzo(k)fluoranthene	ND	2
Benzyl alcohol	ND	2
Bis(2-chloroethoxy)methane	ND	2
Bis(2-chloroethyl)ether	ND	2
Bis(2-chloroisopropyl)ether	ND	2
Bis(2-ethylhexyl)phthalate	ND	2
Butyl benzyl phthalate	ND	2
Carbazole	ND	4
Chrysene	ND	2
Di-n-butyl phthalate	ND	2
Di-n-octyl phthalate	ND	2
Dibenz(a,h)anthracene	ND	2
Dibenzofuran	ND	2
Diethyl phthalate	ND	2
Dimethyl phthalate	ND	2
Ethyl methanesulfonate	ND	2
Fluoranthene	ND	2
Fluorene	ND	2
Hexachlorobenzene	ND	2
Hexachlorobutadiene	ND	2
Hexachlorocyclopentadiene	ND	2

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Hexachloroethane	ND	2						
Indeno(1,2,3-cd)pyrene	ND	2						
Isophorone	ND	2						
Methyl methanesulfonate	ND	2						
N-Decane	ND	2						
N-Nitroso-di-n-butylamine	ND	2						
N-Nitrosodi-n-propylamine	ND	2						
N-Nitrosodiphenylamine	ND	4						
N-Nitrosopiperidine	ND	2						
N-Octadecane	ND	2						
Naphthalene	ND	2						
Nitrobenzene	ND	2						
p-Dimethylaminoazobenzene	ND	2						
Pentachlorobenzene	ND	2						
Pentachloronitrobenzene	ND	2						
Pentachlorophenol	ND	2						
Phenacetin	ND	2						
Phenanthrene	ND	2						
Phenol	ND	2						
Pyrene	ND	2						
Pyridine	ND	2						
2,4,6-Tribromophenol	75	0	100	0	75.0%	10	123	0
2-Fluorobiphenyl	31.3	0	50	0	62.6%	43	116	0
2-Fluorophenol	36.7	0	100	0	36.7%	21	100	0
4-Terphenyl-d14	42.1	0	50	0	84.2%	33	141	0
Nitrobenzene-d5	33.2	0	50	0	66.4%	35	114	0
Phenol-d5	23.4	0	100	0	23.4%	10	94	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									
2-Fluorobiphenyl	570	0	500	0	114.0%	30	115	0			
4-Terphenyl-d14	680	0	500	0	136.0%	18	137	0			
Nitrobenzene-d5	540	0	500	0	108.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203193-02A DUP** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **GP02-01 (56-60)** **0203193** Run ID: **HIT MAN_020322B** SeqNo: **112921**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04	0	0	0.0%	0	0	0	0.0%	20	

Sample ID: **0203188-01A DUP** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **HIT MAN_020326A** SeqNo: **113196**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.08	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011737

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203201-09A DUP** Batch ID: **05 8260 A-3/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020327A** SeqNo: **113591**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	0	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	52.6	0	50	0	105.2%	86	115	0	0.0%	0
Dibromofluoromethane	47.9	0	50	0	95.8%	86	118	0	0.0%	0
Toluene-d8	51.6	0	50	0	103.2%	88	110	0	0.0%	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203200-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020330A** SeqNo: **114153**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	0	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	52.6	0	50	0	105.2%	86	115	0	0.0%	0
Dibromofluoromethane	51.8	0	50	0	103.6%	86	118	0	0.0%	0
Toluene-d8	49.5	0	50	0	99.0%	88	110	0	0.0%	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203221-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020401A** SeqNo: **114085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	22.7	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	54.4	0	50	0	108.8%	86	115	0	0.0%	0
Dibromofluoromethane	51.1	0	50	0	102.2%	86	118	0	0.0%	0
Toluene-d8	51.3	0	50	0	102.6%	88	110	0	0.0%	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203201-03B DUP** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113851**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	100	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	50	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	100	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	100	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Benzene	ND	5	0	0	0.0%	0	0	6.4	0.0%	20	
Bromobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromochloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromodichloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromoform	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Bromomethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Carbon disulfide	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Carbon tetrachloride	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chlorobenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chloroethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Chloroform	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Chloromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
cis-1,2-Dichloroethene	32.5	5	0	0	0.0%	0	0	17.2	61.6%	20	R, Q
cis-1,3-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dibromochloromethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dibromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Dichlorodifluoromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Hexachlorobutadiene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Isopropylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Methylene chloride	ND	100	0	0	0.0%	0	0	0	0.0%	20	
n-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	ND	10	0	0	0.0%	0	0	14.2	0.0%	20	
o-Xylene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
sec-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Styrene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
tert-Butylbenzene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Tetrachloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	5	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
trans-1,3-Dichloropropene	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Trichloroethene	5.65	5	0	0	0.0%	0	0	0	200.0%	20	R, Q
Trichlorofluoromethane	ND	10	0	0	0.0%	0	0	0	0.0%	20	
Vinyl acetate	ND	5	0	0	0.0%	0	0	0	0.0%	20	
Vinyl chloride	ND	10	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	59.6	0	50	0	119.2%	74	121	0	0.0%	0	
Dibromofluoromethane	51.4	0	50	0	102.8%	80	120	0	0.0%	0	
Toluene-d8	57.1	0	50	0	114.2%	81	117	0	0.0%	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-11A DUP** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **GP02-02 (18-20)** **0203193** Run ID: **ANGSTROM_020329A** SeqNo: **113949**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	400	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	200	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	400	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	400	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Benzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromochloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromodichloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromoform	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromomethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Carbon disulfide	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Carbon tetrachloride	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chloroethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Chloroform	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chloromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
cis-1,2-Dichloroethene	39.6	20	0	0	0.0%	0	0	64.4	47.7%	20	R, Q
cis-1,3-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dibromochloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dibromomethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dichlorodifluoromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Hexachlorobutadiene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Iodomethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Isopropylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Methylene chloride	ND	400	0	0	0.0%	0	0	0	0.0%	20	
n-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	492	40	0	0	0.0%	0	0	428	13.9%	20	
o-Xylene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
sec-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Styrene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
tert-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Tetrachloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
trans-1,3-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Trichloroethene	1596	20	0	0	0.0%	0	0	1968	20.9%	20	R, Q
Trichlorofluoromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Vinyl acetate	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Vinyl chloride	ND	40	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	224.8	0	200	0	112.4%	74	121	0	0.0%	0	
Dibromofluoromethane	200	0	200	0	100.0%	80	120	0	0.0%	0	
Toluene-d8	209.6	0	200	0	104.8%	81	117	0	0.0%	0	

Sample ID: **0203188-02A DUP** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**

Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Arsenic	2.26	1	0	0	0.0%	0	0	2.33	3.1%	20	
Barium	73.6	1	0	0	0.0%	0	0	80.4	8.8%	20	
Chromium	12.6	1	0	0	0.0%	0	0	13.3	5.4%	20	
Cobalt	12.8	1	0	0	0.0%	0	0	13.5	5.3%	20	
Copper	13.7	1	0	0	0.0%	0	0	13.5	1.5%	20	
Iron	23200	4	0	0	0.0%	0	0	24200	4.2%	20	
Lead	4.1	1	0	0	0.0%	0	0	4.72	14.1%	20	
Magnesium	2720	10	0	0	0.0%	0	0	2820	3.6%	20	
Manganese	291	1	0	0	0.0%	0	0	287	1.4%	20	
Nickel	13.8	1	0	0	0.0%	0	0	12.8	7.5%	20	
Selenium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Silver	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Titanium	1710	1	0	0	0.0%	0	0	1740	1.7%	20	
Vanadium	67.3	1	0	0	0.0%	0	0	72.1	6.9%	20	
Zinc	46.1	1	0	0	0.0%	0	0	52.9	13.7%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203177-03A DUP** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113253**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4,5-Tetrachlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
1,2,4-Trichlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
1,2-Dichlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
1,2-Diphenylhydrazine	ND	2	0	0	0.0%	0	0	0	0.0%	30	
1,3-Dichlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
1,4-Dichlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,3,4,6-Tetrachlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,4,5-Trichlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,4,6-Trichlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,4-Dichlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,4-Dimethylphenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,4-Dinitrophenol	ND	10	0	0	0.0%	0	0	0	0.0%	30	
2,4-Dinitrotoluene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,6-Dichlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2,6-Dinitrotoluene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Chloronaphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Chlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Methylnaphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Methylphenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Nitroaniline	ND	2	0	0	0.0%	0	0	0	0.0%	30	
2-Nitrophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
3&4-Methylphenol	ND	4	0	0	0.0%	0	0	0	0.0%	30	
3-Methylcholanthrene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
3-Nitroaniline	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4,6-Dinitro-2-methylphenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4-Aminobiphenyl	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4-Bromophenyl phenyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4-Chloro-3-methylphenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4-Chlorophenyl phenyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

4-Nitroaniline	ND	2	0	0	0.0%	0	0	0	0.0%	30	
4-Nitrophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
7,12-Dimethylbenz(a)anthracene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Acetophenone	ND	4	0	0	0.0%	0	0	0	0.0%	30	
Aniline	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Benzyl alcohol	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Bis(2-chloroethoxy)methane	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Bis(2-chloroethyl)ether	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Bis(2-chloroisopropyl)ether	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Bis(2-ethylhexyl)phthalate	2	2	0	0	0.0%	0	0	6.36	104.3%	30	R, Q
Butyl benzyl phthalate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Carbazole	ND	4	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Di-n-butyl phthalate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Di-n-octyl phthalate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Dibenzofuran	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Diethyl phthalate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Dimethyl phthalate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Ethyl methanesulfonate	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Hexachlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	30	
Hexachlorocyclopentadiene	ND	2	0	0	0.0%	0	0	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Duplicate

Hexachloroethane	ND	2	0	0	0.0%	0	0	0	0.0%	30
Indeno(1,2,3-cd)pyrene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Isophorone	ND	2	0	0	0.0%	0	0	0	0.0%	30
Methyl methanesulfonate	ND	2	0	0	0.0%	0	0	0	0.0%	30
N-Decane	ND	2	0	0	0.0%	0	0	0	0.0%	30
N-Nitroso-di-n-butylamine	ND	2	0	0	0.0%	0	0	0	0.0%	30
N-Nitrosodi-n-propylamine	ND	2	0	0	0.0%	0	0	0	0.0%	30
N-Nitrosodiphenylamine	ND	4	0	0	0.0%	0	0	0	0.0%	30
N-Nitrosopiperidine	ND	2	0	0	0.0%	0	0	0	0.0%	30
N-Octadecane	ND	2	0	0	0.0%	0	0	0	0.0%	30
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Nitrobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30
p-Dimethylaminoazobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Pentachlorobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Pentachloronitrobenzene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Pentachlorophenol	ND	2	0	0	0.0%	0	0	0	0.0%	30
Phenacetin	ND	2	0	0	0.0%	0	0	0	0.0%	30
Phenanthrene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Phenol	ND	2	0	0	0.0%	0	0	0	0.0%	30
Pyrene	ND	2	0	0	0.0%	0	0	0	0.0%	30
Pyridine	ND	2	0	0	0.0%	0	0	0	0.0%	30
2,4,6-Tribromophenol	86	0	100	0	86.0%	10	123	0	0.0%	30
2-Fluorobiphenyl	38.6	0	50	0	77.2%	43	116	0	0.0%	30
2-Fluorophenol	45.7	0	100	0	45.7%	21	100	0	0.0%	30
4-Terphenyl-d14	45.1	0	50	0	90.2%	33	141	0	0.0%	30
Nitrobenzene-d5	39.1	0	50	0	78.2%	35	114	0	0.0%	30
Phenol-d5	30.4	0	100	0	30.4%	10	94	0	0.0%	30

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-02A DUP** Batch ID: **4035** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**
Client ID: **GP02-01 (56-60)** **0203193** Run ID: **ICP_020326A** SeqNo: **113341**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Arsenic, 200.7 Diss	.0059	0.006	0	0	0.0%	0	0	0.0075	0.0%	20	
Barium, 200.7 Diss	.0603	0.005	0	0	0.0%	0	0	0.0601	0.3%	20	
Chromium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Cobalt, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Copper, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Iron, 200.7 Diss	59.3	0.01	0	0	0.0%	0	0	59.1	0.3%	20	
Lead, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Magnesium, 200.7 Diss	33	0.05	0	0	0.0%	0	0	32.9	0.3%	20	
Manganese, 200.7 Diss	4.65	0.005	0	0	0.0%	0	0	4.64	0.2%	20	
Nickel, 200.7 Diss	.0082	0.005	0	0	0.0%	0	0	0.0077	6.3%	20	
Selenium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Silver, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Titanium, 200.7	ND	0.01	0	0	0.0%	0	0	0	0.0%	20	
Vanadium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Zinc, 200.7 Diss	.0329	0.005	0	0	0.0%	0	0	0.0331	0.6%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203188-01A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Naphthalene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Phenanthrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	495	0	500	0	99.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-11A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **GP02-02 (18-20)** **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113349**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	55	50	0	0	0.0%	0	0	50	9.5%	30	
Anthracene	75	50	0	0	0.0%	0	0	75	0.0%	30	
Benz(a)anthracene	255	50	0	0	0.0%	0	0	275	7.5%	30	
Benzo(a)pyrene	465	50	0	0	0.0%	0	0	440	5.5%	30	
Benzo(b)fluoranthene	245	50	0	0	0.0%	0	0	235	4.2%	30	
Benzo(g,h,i)perylene	435	50	0	0	0.0%	0	0	405	7.1%	30	
Benzo(k)fluoranthene	235	50	0	0	0.0%	0	0	270	13.9%	30	
Chrysene	410	50	0	0	0.0%	0	0	395	3.7%	30	
Dibenz(a,h)anthracene	75	50	0	0	0.0%	0	0	70	6.9%	30	
Fluoranthene	560	50	0	0	0.0%	0	0	675	18.6%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	305	50	0	0	0.0%	0	0	285	6.8%	30	
Naphthalene	50	50	0	0	0.0%	0	0	0	200.0%	30	R, T
Phenanthrene	110	50	0	0	0.0%	0	0	160	37.0%	30	R, T
Pyrene	595	50	0	0	0.0%	0	0	690	14.8%	30	
2-Fluorobiphenyl	650	0	500	0	130.0%	30	115	0	0.0%	30	S, MI
4-Terphenyl-d14	635	0	500	0	127.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	600	0	500	0	120.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203193-01A MS** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **GP02-01 (34-38)** **0203193** Run ID: **HIT MAN_020322B** SeqNo: **112919**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	4.96	0.2	0.5	4.41	110.0%	75	125	0			

Sample ID: **0203188-02A MS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **HIT MAN_020326A** SeqNo: **113198**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.836	0.08	0.2	0.34	124.0%	75	125	0			

Sample ID: **0203193-02A MS** Batch ID: **05 8260 A-3/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **GP02-01 (56-60)** **0203193** Run ID: **ANGSTROM_020327A** SeqNo: **113584**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	10.9	1	10	0	109.0%	0	234	0			
Benzene	9.9	1	10	0	99.0%	37	151	0			
Chlorobenzene	9.63	1	10	0	96.3%	37	160	0			
Toluene	10.2	1	10	0	102.0%	47	150	0			
Trichloroethene	9.34	1	10	0	93.4%	71	157	0			
4-Bromofluorobenzene	48.9	0	50	0	97.8%	86	115	0			
Dibromofluoromethane	53.8	0	50	0	107.6%	86	118	0			
Toluene-d8	51.1	0	50	0	102.2%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203200-09A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020330A** SeqNo: **114155**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	33.9	1	40	0	84.7%	0	234	0			
Benzene	39.4	1	40	0	98.5%	37	151	0			
Chlorobenzene	37.2	1	40	0	93.0%	37	160	0			
Toluene	38	1	40	0	95.0%	47	150	0			
Trichloroethene	41.2	1	40	2.55	96.6%	71	157	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	50.2	0	50	0	100.4%	86	118	0			
Toluene-d8	50.7	0	50	0	101.4%	88	110	0			

Sample ID: **0203221-07A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020401A** SeqNo: **114083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	8.42	1	10	0	84.2%	0	234	0			
Benzene	10.7	1	10	0	107.0%	37	151	0			
Chlorobenzene	10.1	1	10	0	101.0%	37	160	0			
Toluene	10.1	1	10	0	101.0%	47	150	0			
Trichloroethene	10.6	1	10	0	106.0%	71	157	0			
4-Bromofluorobenzene	53.8	0	50	0	107.6%	86	115	0			
Dibromofluoromethane	52.4	0	50	0	104.8%	86	118	0			
Toluene-d8	52.5	0	50	0	105.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203188-01A MS** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	51.2	5	50	0	102.4%	0	234	0			
Benzene	52.5	5	50	0	105.0%	37	151	0			
Chlorobenzene	55.3	5	50	0	110.6%	37	160	0			
Toluene	54.54	5	50	0	109.1%	47	150	0			
Trichloroethene	47.3	5	50	0	94.6%	71	157	0			
4-Bromofluorobenzene	53.9	0	50	0	107.8%	74	121	0			
Dibromofluoromethane	50.3	0	50	0	100.6%	80	120	0			
Toluene-d8	51.4	0	50	0	102.8%	81	117	0			

Sample ID: **0203212-03A MS** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020329A** SeqNo: **113955**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	210	5	200	0	105.0%	0	234	0			
Benzene	194	5	200	0	97.0%	37	151	0			
Chlorobenzene	153	5	200	0	76.5%	37	160	0			
Toluene	202	5	200	0	101.0%	47	150	0			
Trichloroethene	195	5	200	0	97.5%	71	157	0			
4-Bromofluorobenzene	52.3	0	50	0	104.6%	74	121	0			
Dibromofluoromethane	56.1	0	50	0	112.2%	80	120	0			
Toluene-d8	50.5	0	50	0	101.0%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203188-01A MS** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	18.3	1	50	0	36.6%	75	125	0			S,MI
Arsenic	43	1	50	1.83	82.3%	75	125	0			
Barium	161	1	50	112	98.0%	75	125	0			
Chromium	67	1	50	22.3	89.4%	75	125	0			
Cobalt	56.9	1	50	13	87.8%	75	125	0			
Copper	69.9	1	50	21.9	96.0%	75	125	0			
Iron	25500	4	500	25200	60.0%	75	125	0			S,M
Lead	56.3	1	50	9.87	92.9%	75	125	0			
Magnesium	4730	10	500	4330	80.0%	75	125	0			
Manganese	378	1	50	316	124.0%	75	125	0			
Nickel	62	1	50	18.3	87.4%	75	125	0			
Selenium	40.4	1	50	0	80.8%	75	125	0			
Silver	43.9	1	50	0	87.8%	75	125	0			
Titanium	1430	1	50	1490	-120.0%	75	125	0			S,M
Vanadium	113	1	50	68.5	89.0%	75	125	0			
Zinc	137	1	50	80.8	112.4%	75	125	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike Duplicate

Sample ID: **0203188-01A MSD** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	20.5	1	50	0	41.0%	75	125	18.3	11.3%	20	S
Arsenic	43.2	1	50	1.83	82.7%	75	125	43	0.5%	20	
Barium	158	1	50	112	92.0%	75	125	161	1.9%	20	
Chromium	66.5	1	50	22.3	88.4%	75	125	67	0.7%	20	
Cobalt	57.1	1	50	13	88.2%	75	125	56.9	0.4%	20	
Copper	67.8	1	50	21.9	91.8%	75	125	69.9	3.1%	20	
Iron	25100	4	500	25200	-20.0%	75	125	25500	1.6%	20	S
Lead	54.3	1	50	9.87	88.9%	75	125	56.3	3.6%	20	
Magnesium	4730	10	500	4330	80.0%	75	125	4730	0.0%	20	
Manganese	364	1	50	316	96.0%	75	125	378	3.8%	20	
Nickel	61.7	1	50	18.3	86.8%	75	125	62	0.5%	20	
Selenium	41.2	1	50	0	82.4%	75	125	40.4	2.0%	20	
Silver	44.3	1	50	0	88.6%	75	125	43.9	0.9%	20	
Titanium	1440	1	50	1490	-100.0%	75	125	1430	0.7%	20	S
Vanadium	112	1	50	68.5	87.0%	75	125	113	0.9%	20	
Zinc	129	1	50	80.8	96.4%	75	125	137	6.0%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203177-04A MS** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113255**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	35.1	2	50	0	70.2%	44	142	0			
1,4-Dichlorobenzene	36.8	2	50	0	73.6%	20	124	0			
2,4-Dinitrotoluene	41	2	50	0	82.0%	39	139	0			
2-Chlorophenol	75.4	2	100	0	75.4%	23	134	0			
4-Chloro-3-methylphenol	85.8	2	100	0	85.8%	22	147	0			
4-Nitrophenol	34.9	2	100	0	34.9%	1	132	0			
Acenaphthene	43.6	2	50	0	87.2%	47	145	0			
N-Nitrosodi-n-propylamine	52.1	2	50	0	104.2%	1	230	0			
Pentachlorophenol	97.8	2	100	0	97.8%	14	176	0			
Phenol	34.1	2	100	0	34.1%	5	112	0			
Pyrene	53.1	2	50	0	106.2%	52	115	0			
2,4,6-Tribromophenol	93.6	0	100	0	93.6%	10	123	0			
2-Fluorobiphenyl	42.9	0	50	0	85.8%	43	116	0			
2-Fluorophenol	50.2	0	100	0	50.2%	21	100	0			
4-Terphenyl-d14	46.8	0	50	0	93.6%	33	141	0			
Nitrobenzene-d5	41.8	0	50	0	83.6%	35	114	0			
Phenol-d5	34.1	0	100	0	34.1%	10	94	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203193-01A MS** Batch ID: **4035** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**
Client ID: **GP02-01 (34-38)** **0203193** Run ID: **ICP_020326A** SeqNo: **113338**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.483	0.005	0.5	0	96.6%	70	130	0			
Arsenic, 200.7 Diss	.488	0.006	0.5	0.0095	95.7%	70	130	0			
Barium, 200.7 Diss	.584	0.005	0.5	0.0973	97.3%	70	130	0			
Chromium, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0			
Cobalt, 200.7 Diss	.484	0.005	0.5	0.0071	95.4%	70	130	0			
Copper, 200.7 Diss	.506	0.005	0.5	0	101.2%	70	130	0			
Iron, 200.7 Diss	104	0.01	5	99	100.0%	70	130	0			
Lead, 200.7 Diss	.471	0.005	0.5	0	94.2%	70	130	0			
Magnesium, 200.7 Diss	84	0.05	5	78.7	106.0%	70	130	0			
Manganese, 200.7 Diss	112	0.01	0.5	10.5	20300.0%	70	130	0			S,M
Nickel, 200.7 Diss	.47	0.005	0.5	0	94.0%	70	130	0			
Selenium, 200.7 Diss	.495	0.005	0.5	0.0063	97.7%	70	130	0			
Silver, 200.7 Diss	.495	0.005	0.5	0	99.0%	70	130	0			
Titanium, 200.7	.5	0.01	0.5	0	100.0%	70	130	0			
Vanadium, 200.7 Diss	.485	0.005	0.5	0	97.0%	70	130	0			
Zinc, 200.7 Diss	.501	0.005	0.5	0.0159	97.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike Duplicate

Sample ID: **0203193-01A MSD** Batch ID: **4035** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**
Client ID: **GP02-01 (34-38)** **0203193** Run ID: **ICP_020326A** SeqNo: **113339**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.483	0.2%	20	
Arsenic, 200.7 Diss	.486	0.006	0.5	0.0095	95.3%	70	130	0.488	0.4%	20	
Barium, 200.7 Diss	.579	0.005	0.5	0.0973	96.3%	70	130	0.584	0.9%	20	
Chromium, 200.7 Diss	.478	0.005	0.5	0	95.6%	70	130	0.482	0.8%	20	
Cobalt, 200.7 Diss	.481	0.005	0.5	0.0071	94.8%	70	130	0.484	0.6%	20	
Copper, 200.7 Diss	.501	0.005	0.5	0	100.2%	70	130	0.506	1.0%	20	
Iron, 200.7 Diss	103	0.01	5	99	80.0%	70	130	104	1.0%	20	
Lead, 200.7 Diss	.467	0.005	0.5	0	93.4%	70	130	0.471	0.9%	20	
Magnesium, 200.7 Diss	83.3	0.05	5	78.7	92.0%	70	130	84	0.8%	20	
Manganese, 200.7 Diss	10.8	0.01	0.5	10.5	60.0%	70	130	112	164.8%	20	S,R,M
Nickel, 200.7 Diss	.464	0.005	0.5	0	92.8%	70	130	0.47	1.3%	20	
Selenium, 200.7 Diss	.49	0.005	0.5	0.0063	96.7%	70	130	0.495	1.0%	20	
Silver, 200.7 Diss	.492	0.005	0.5	0	98.4%	70	130	0.495	0.6%	20	
Titanium, 200.7	.497	0.01	0.5	0	99.4%	70	130	0.5	0.6%	20	
Vanadium, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.485	0.6%	20	
Zinc, 200.7 Diss	.498	0.005	0.5	0.0159	96.4%	70	130	0.501	0.6%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203188-02A MS** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113187**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1055	50	500	1000	11.0%	47	145	0			S, MI
Acenaphthylene	1055	50	500	925	26.0%	33	145	0			S, MI
Anthracene	1775	50	500	2100	-65.0%	27	133	0			S, MI
Benz(a)anthracene	1865	50	500	2600	-147.0%	33	143	0			S, MI
Benzo(a)pyrene	2035	50	500	2980	-189.0%	17	163	0			S, MI
Benzo(b)fluoranthene	1425	50	500	1760	-67.0%	24	159	0			S, MI
Benzo(g,h,i)perylene	1715	50	500	2290	-115.0%	1	219	0			S, MI
Benzo(k)fluoranthene	1325	50	500	1700	-75.0%	11	162	0			S, MI
Chrysene	2355	50	500	3540	-237.0%	17	168	0			S, MI
Dibenz(a,h)anthracene	810	50	500	335	95.0%	1	227	0			
Fluoranthene	3800	50	500	5500	-340.0%	26	137	0			S, MI
Fluorene	1365	50	500	1360	1.0%	59	121	0			S, MI
Indeno(1,2,3-cd)pyrene	1380	50	500	1600	-44.0%	1	171	0			S, MI
Naphthalene	720	50	500	355	73.0%	21	133	0			
Phenanthrene	4350	50	500	6200	-370.0%	54	120	0			S, MI
Pyrene	4450	50	500	7100	-530.0%	52	115	0			S, MI
2-Fluorobiphenyl	660	0	500	0	132.0%	30	115	0			S, MI
4-Terphenyl-d14	640	0	500	0	128.0%	18	137	0			
Nitrobenzene-d5	570	0	500	0	114.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011767

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203193** Run ID: **HIT MAN_020322B** SeqNo: **112917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.199	0.04	0.2	0	99.5%	86	121	0			

Sample ID: **LCSD** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203193** Run ID: **HIT MAN_020322B** SeqNo: **112930**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.203	0.04	0.2	0	101.5%	86	121	0.199	2.0%	20	

Sample ID: **LCS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **HIT MAN_020326A** SeqNo: **113194**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.205	0.04	0.2	0	102.5%	85	115	0			

Sample ID: **LCS** Batch ID: **05 8260 A-3/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020327A** SeqNo: **113581**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	20.9	1	20	0	104.5%	0	234	0			
Benzene	19.7	1	20	0	98.5%	37	151	0			
Chlorobenzene	19.2	1	20	0	96.0%	37	160	0			
Toluene	19.5	1	20	0	97.5%	47	150	0			
Trichloroethene	18.7	1	20	0	93.5%	71	157	0			
4-Bromofluorobenzene	50	0	50	0	100.0%	86	115	0			
Dibromofluoromethane	52.5	0	50	0	105.0%	86	118	0			
Toluene-d8	52	0	50	0	104.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020401A** SeqNo: **114079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	15.5	1	20	0	77.5%	0	234	0			
Benzene	19.4	1	20	0	97.0%	37	151	0			
Chlorobenzene	18.9	1	20	0	94.5%	37	160	0			
Toluene	18.1	1	20	0	90.5%	47	150	0			
Trichloroethene	18.8	1	20	0	94.0%	71	157	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	50.1	0	50	0	100.2%	86	118	0			
Toluene-d8	51	0	50	0	102.0%	88	110	0			

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020330A** SeqNo: **114151**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	47.1	1	50	0	94.2%	0	234	0			
Benzene	53.6	1	50	0	107.2%	37	151	0			
Chlorobenzene	51	1	50	0	102.0%	37	160	0			
Toluene	50.7	1	50	0	101.4%	47	150	0			
Trichloroethene	51.2	1	50	0	102.4%	71	157	0			
4-Bromofluorobenzene	52	0	50	0	104.0%	86	115	0			
Dibromofluoromethane	50.5	0	50	0	101.0%	86	118	0			
Toluene-d8	50.8	0	50	0	101.6%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	111.5	5	100	0	111.5%	0	234	0			
Benzene	91.5	5	100	0	91.5%	37	151	0			
Chlorobenzene	86	5	100	0	86.0%	37	160	0			
Toluene	91	5	100	0	91.0%	47	150	0			
Trichloroethene	85	5	100	0	85.0%	71	157	0			
4-Bromofluorobenzene	49.6	0	50	0	99.2%	74	121	0			
Dibromofluoromethane	56.7	0	50	0	113.4%	80	120	0			
Toluene-d8	50.2	0	50	0	100.4%	81	117	0			

Sample ID: **LCS** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020329A** SeqNo: **113947**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	25.5	5	25	0	102.0%	0	234	0			
Benzene	23.6	5	25	0	94.4%	37	151	0			
Chlorobenzene	20.4	5	25	0	81.6%	37	160	0			
Toluene	25.9	5	25	0	103.6%	47	150	0			
Trichloroethene	26.1	5	25	0	104.4%	71	157	0			
4-Bromofluorobenzene	48.7	0	50	0	97.4%	74	121	0			
Dibromofluoromethane	54.2	0	50	0	108.4%	80	120	0			
Toluene-d8	50.8	0	50	0	101.6%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4027** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/22/02** Prep Date: **3/21/02**

Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112905**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	45.6	1	50	0	91.2%	80	120	0			
Arsenic	44.8	1	50	0	89.6%	80	120	0			
Barium	48.8	1	50	0	97.6%	80	120	0			
Chromium	48.8	1	50	0	97.6%	80	120	0			
Cobalt	48.1	1	50	0	96.2%	80	120	0			
Copper	47.9	1	50	0	95.8%	80	120	0			
Iron	497	2	500	0	99.4%	80	120	0			
Lead	47.6	1	50	0	95.2%	80	120	0			
Magnesium	472	10	500	0	94.4%	80	120	0			
Manganese	48.2	1	50	0	96.4%	80	120	0			
Nickel	47.8	1	50	0	95.6%	80	120	0			
Selenium	45.1	1	50	0	90.2%	80	120	0			
Silver	46.4	1	50	0	92.8%	80	120	0			
Titanium	49.9	1	50	0	99.8%	80	120	0			
Vanadium	48.5	1	50	0	97.0%	80	120	0			
Zinc	46.9	1	50	0	93.8%	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4029** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date: **3/21/02**

Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	24.6	2	50	0	49.2%	44	142	0			
1,4-Dichlorobenzene	25.9	2	50	0	51.8%	20	124	0			
2,4-Dinitrotoluene	31.4	2	50	0	62.8%	39	139	0			
2-Chlorophenol	54.6	2	100	0	54.6%	23	134	0			
4-Chloro-3-methylphenol	65	2	100	0	65.0%	22	147	0			
4-Nitrophenol	19.12	2	100	0	19.1%	1	132	0			
Acenaphthene	31.3	2	50	0	62.6%	47	145	0			
N-Nitrosodi-n-propylamine	36.3	2	50	0	72.6%	1	230	0			
Pentachlorophenol	70.7	2	100	0	70.7%	14	176	0			
Phenol	22.3	2	100	0	22.3%	5	112	0			
Pyrene	41.5	2	50	0	83.0%	52	115	0			
2,4,6-Tribromophenol	72.5	0	100	0	72.5%	10	123	0			
2-Fluorobiphenyl	29.7	0	50	0	59.4%	43	116	0			
2-Fluorophenol	33.8	0	100	0	33.8%	21	100	0			
4-Terphenyl-d14	39.4	0	50	0	78.8%	33	141	0			
Nitrobenzene-d5	29.8	0	50	0	59.6%	35	114	0			
Phenol-d5	22.4	0	100	0	22.4%	10	94	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4029** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113250**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trichlorobenzene	30.4	2	50	0	60.8%	44	142	24.6	21.1%	28	
1,4-Dichlorobenzene	31.4	2	50	0	62.8%	20	124	25.9	19.2%	32	
2,4-Dinitrotoluene	39.1	2	50	0	78.2%	39	139	31.4	21.8%	22	
2-Chlorophenol	69.2	2	100	0	69.2%	23	134	54.6	23.6%	29	
4-Chloro-3-methylphenol	80.7	2	100	0	80.7%	22	147	65	21.6%	37	
4-Nitrophenol	18.9	2	100	0	18.9%	1	132	19.12	1.2%	47	
Acenaphthene	39.1	2	50	0	78.2%	47	145	31.3	22.2%	28	
N-Nitrosodi-n-propylamine	46.7	2	50	0	93.4%	1	230	36.3	25.1%	55	
Pentachlorophenol	87.6	2	100	0	87.6%	14	176	70.7	21.4%	49	
Phenol	26.8	2	100	0	26.8%	5	112	22.3	18.3%	23	
Pyrene	50.4	2	50	0	100.8%	52	115	41.5	19.4%	25	
2,4,6-Tribromophenol	87	0	100	0	87.0%	10	123	0	0.0%	0	
2-Fluorobiphenyl	38.6	0	50	0	77.2%	43	116	0	0.0%	0	
2-Fluorophenol	43.5	0	100	0	43.5%	21	100	0	0.0%	0	
4-Terphenyl-d14	46.6	0	50	0	93.2%	33	141	0	0.0%	0	
Nitrobenzene-d5	38.2	0	50	0	76.4%	35	114	0	0.0%	0	
Phenol-d5	29.1	0	100	0	29.1%	10	94	0	0.0%	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4035** Batch ID: **4035** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**

Client ID: **0203193** Run ID: **ICP_020326A** SeqNo: **113336**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.467	0.005	0.5	0	93.4%	85	115	0			
Arsenic, 200.7	.468	0.006	0.5	0	93.6%	85	115	0			
Barium, 200.7	.474	0.005	0.5	0	94.8%	85	115	0			
Chromium, 200.7	.49	0.005	0.5	0	98.0%	85	115	0			
Cobalt, 200.7	.489	0.005	0.5	0	97.8%	85	115	0			
Copper, 200.7	.488	0.005	0.5	0	97.6%	85	115	0			
Iron, 200.7	5.08	0.01	5	0	101.6%	85	115	0			
Lead, 200.7	.485	0.005	0.5	0	97.0%	85	115	0			
Magnesium, 200.7	4.86	0.05	5	0	97.2%	85	115	0			
Manganese, 200.7	.486	0.005	0.5	0	97.2%	85	115	0			
Nickel, 200.7	.48	0.005	0.5	0	96.0%	85	115	0			
Selenium, 200.7	.481	0.005	0.5	0	96.2%	85	115	0			
Silver, 200.7	.475	0.005	0.5	0	95.0%	85	115	0			
Titanium, 200.7	.5	0.01	0.5	0	100.0%	85	115	0			
Vanadium, 200.7	.484	0.005	0.5	0	96.8%	85	115	0			
Zinc, 200.7	.486	0.005	0.5	0	97.2%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID: **LCS-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	515	50	500	0	103.0%	47	145	0			
Acenaphthylene	490	50	500	0	98.0%	33	145	0			
Anthracene	570	50	500	0	114.0%	27	133	0			
Benz(a)anthracene	390	50	500	0	78.0%	33	143	0			
Benzo(a)pyrene	320	50	500	0	64.0%	17	163	0			
Benzo(b)fluoranthene	350	50	500	0	70.0%	24	159	0			
Benzo(g,h,i)perylene	465	50	500	0	93.0%	1	219	0			
Benzo(k)fluoranthene	595	50	500	0	119.0%	11	162	0			
Chrysene	585	50	500	0	117.0%	17	168	0			
Dibenz(a,h)anthracene	395	50	500	0	79.0%	1	227	0			
Fluoranthene	545	50	500	0	109.0%	26	137	0			
Fluorene	515	50	500	0	103.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	430	50	500	0	86.0%	1	171	0			
Naphthalene	505	50	500	0	101.0%	21	133	0			
Phenanthrene	460	50	500	0	92.0%	54	120	0			
Pyrene	525	50	500	0	105.0%	52	115	0			
2-Fluorobiphenyl	575	0	500	0	115.0%	30	115	0			
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0			
Nitrobenzene-d5	470	0	500	0	94.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113178**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	560	50	500	0	112.0%	47	145	515	8.4%	30	
Acenaphthylene	530	50	500	0	106.0%	33	145	490	7.8%	30	
Anthracene	615	50	500	0	123.0%	27	133	570	7.6%	30	
Benz(a)anthracene	425	50	500	0	85.0%	33	143	390	8.6%	30	
Benzo(a)pyrene	405	50	500	0	81.0%	17	163	320	23.4%	30	
Benzo(b)fluoranthene	400	50	500	0	80.0%	24	159	350	13.3%	30	
Benzo(g,h,i)perylene	495	50	500	0	99.0%	1	219	465	6.3%	30	
Benzo(k)fluoranthene	620	50	500	0	124.0%	11	162	595	4.1%	30	
Chrysene	625	50	500	0	125.0%	17	168	585	6.6%	30	
Dibenz(a,h)anthracene	465	50	500	0	93.0%	1	227	395	16.3%	30	
Fluoranthene	655	50	500	0	131.0%	26	137	545	18.3%	30	
Fluorene	550	50	500	0	110.0%	59	121	515	6.6%	30	
Indeno(1,2,3-cd)pyrene	450	50	500	0	90.0%	1	171	430	4.5%	30	
Naphthalene	555	50	500	0	111.0%	21	133	505	9.4%	30	
Phenanthrene	515	50	500	0	103.0%	54	120	460	11.3%	30	
Pyrene	510	50	500	0	102.0%	52	115	525	2.9%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	545	0	500	0	109.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	490	0	500	0	98.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 A-3/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020327A** SeqNo: **113579**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	102	1	100	0	102.0%	80	120	0			
1,2-Dichloropropane	105	1	100	0	105.0%	80	120	0			
Chloroform	92.5	1	100	0	92.5%	80	120	0			
Ethylbenzene	111	1	100	0	111.0%	80	120	0			
Toluene	106	1	100	0	106.0%	80	120	0			
Vinyl chloride	107	1.2	100	0	107.0%	80	120	0			
4-Bromofluorobenzene	50.3	0	50	0	100.6%	86	115	0			
Dibromofluoromethane	42.5	0	50	0	85.0%	86	118	0			S
Toluene-d8	50	0	50	0	100.0%	88	110	0			

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203193** Run ID: **HORATIO_020401A** SeqNo: **114078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49.8	1	50	0	99.6%	80	120	0			
1,2-Dichloropropane	54.5	1	50	0	109.0%	80	120	0			
Chloroform	54.3	1	50	0	108.6%	80	120	0			
Ethylbenzene	51.3	1	50	0	102.6%	80	120	0			
Toluene	53.2	1	50	0	106.4%	80	120	0			
Vinyl chloride	49.4	1.2	50	0	98.8%	80	120	0			
4-Bromofluorobenzene	50.3	0	50	0	100.6%	86	115	0			
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0			
Toluene-d8	52.3	0	50	0	104.6%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:

Client ID: **0203193** Run ID: **HORATIO_020330A** SeqNo: **114150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	19.88	1	20	0	99.4%	80	120	0			
1,2-Dichloropropane	20.8	1	20	0	104.0%	80	120	0			
Chloroform	20.3	1	20	0	101.5%	80	120	0			
Ethylbenzene	20.85	1	20	0	104.3%	80	120	0			
Toluene	20	1	20	0	100.0%	80	120	0			
Vinyl chloride	21.75	1.2	20	0	108.8%	80	120	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	49.2	0	50	0	98.4%	86	118	0			
Toluene-d8	50.5	0	50	0	101.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113846**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	53.6	5	50	0	107.2%	80	120	0			
1,2-Dichloropropane	50.5	5	50	0	101.0%	80	120	0			
Chloroform	47.3	5	50	0	94.6%	80	120	0			
Ethylbenzene	52.5	5	50	0	105.0%	80	120	0			
Toluene	49.1	5	50	0	98.2%	80	120	0			
Vinyl chloride	53.4	10	50	0	106.8%	80	120	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	48.6	0	50	0	97.2%	86	118	0			
Toluene-d8	49.7	0	50	0	99.4%	88	110	0			

Sample ID: **CCV** Batch ID: **05 8260 S-3/3** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/28/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020328A** SeqNo: **113846**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	53.6	5	50	0	107.2%	80	120	0			
1,2-Dichloropropane	50.5	5	50	0	101.0%	80	120	0			
Chloroform	47.3	5	50	0	94.6%	80	120	0			
Ethylbenzene	52.5	5	50	0	105.0%	80	120	0			
Toluene	49.1	5	50	0	98.2%	80	120	0			
Vinyl chloride	53.4	10	50	0	106.8%	80	120	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	48.6	0	50	0	97.2%	86	118	0			
Toluene-d8	49.7	0	50	0	99.4%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203193** Run ID: **ANGSTROM_020329A** SeqNo: **113946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	106	5	100	0	106.0%	80	120	0			
1,2-Dichloropropane	104	5	100	0	104.0%	80	120	0			
Chloroform	99.7	5	100	0	99.7%	80	120	0			
Ethylbenzene	105	5	100	0	105.0%	80	120	0			
Toluene	102	5	100	0	102.0%	80	120	0			
Vinyl chloride	108	10	100	0	108.0%	80	120	0			
4-Bromofluorobenzene	49.7	0	50	0	99.4%	86	115	0			
Dibromofluoromethane	46.8	0	50	0	93.6%	86	118	0			
Toluene-d8	48.7	0	50	0	97.4%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4029** Test Code: **EPA 8270C** Units: **µg/L** Analysis Date: **3/26/02** Prep Date:
Client ID: **0203193** Run ID: **MANFREDD_020326A** SeqNo: **113248**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	63.7	2	70	0	91.0%	80	120	0			
2,4,6-Trichlorophenol	75.9	2	70	0	108.4%	80	120	0			
2,4-Dichlorophenol	64.6	2	70	0	92.3%	80	120	0			
2-Nitrophenol	64.9	2	70	0	92.7%	80	120	0			
4-Chloro-3-methylphenol	68.2	2	70	0	97.4%	80	120	0			
Acenaphthene	80.6	2	70	0	115.1%	80	120	0			
Benzo(a)pyrene	72	2	70	0	102.9%	80	120	0			
Di-n-octyl phthalate	64.5	2	70	0	92.1%	80	120	0			
Fluoranthene	81.5	2	70	0	116.4%	80	120	0			
Hexachlorobutadiene	64.5	2	70	0	92.1%	80	120	0			
N-Nitrosodiphenylamine	144	4	140	0	102.9%	80	120	0			
Pentachlorophenol	77	2	70	0	110.0%	80	120	0			
Phenol	65.1	2	70	0	93.0%	80	120	0			
2,4,6-Tribromophenol	77.5	0	70	0	110.7%	80	120	0			
2-Fluorobiphenyl	82.5	0	70	0	117.9%	80	120	0			
2-Fluorophenol	74.1	0	70	0	105.9%	80	120	0			
4-Terphenyl-d14	67.3	0	70	0	96.1%	80	120	0			
Nitrobenzene-d5	62.6	0	70	0	89.4%	80	120	0			
Phenol-d5	67.3	0	70	0	96.1%	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/25/02** Prep Date:

Client ID: **0203193** Run ID: **MANFREDD_020325B** SeqNo: **113176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.97	0.1	1	0	97.0%	80	120	0			
Acenaphthylene	.96	0.1	1	0	96.0%	80	120	0			
Anthracene	1.08	0.1	1	0	108.0%	80	120	0			
Benz(a)anthracene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(a)pyrene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(b)fluoranthene	.8	0.1	1	0	80.0%	80	120	0			
Benzo(g,h,i)perylene	.9	0.1	1	0	90.0%	80	120	0			
Benzo(k)fluoranthene	.97	0.1	1	0	97.0%	80	120	0			
Chrysene	1.09	0.1	1	0	109.0%	80	120	0			
Dibenz(a,h)anthracene	.85	0.1	1	0	85.0%	80	120	0			
Fluoranthene	1.1	0.1	1	0	110.0%	80	120	0			
Fluorene	1.02	0.1	1	0	102.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.84	0.1	1	0	84.0%	80	120	0			
Naphthalene	1.2	0.1	1	0	120.0%	80	120	0			
Phenanthrene	.97	0.1	1	0	97.0%	80	120	0			
Pyrene	.95	0.1	1	0	95.0%	80	120	0			
2-Fluorobiphenyl	.97	0	1	0	97.0%	30	115	0			
4-Terphenyl-d14	.85	0	1	0	85.0%	18	137	0			
Nitrobenzene-d5	1.03	0	1	0	103.0%	23	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112903**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	24.9	0.01	25	0	99.6%	90	110	0			
Magnesium	24.7	0.05	25	0	98.8%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4027** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/21/02**
Client ID: **0203193** Run ID: **ICP_020322A** SeqNo: **112902**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	.476	0.005	0.5	0	95.2%	90	110	0			
Arsenic	.484	0.005	0.5	0	96.8%	90	110	0			
Barium	.498	0.005	0.5	0	99.6%	90	110	0			
Chromium	.492	0.005	0.5	0	98.4%	90	110	0			
Cobalt	.49	0.005	0.5	0	98.0%	90	110	0			
Copper	.48	0.005	0.5	0	96.0%	90	110	0			
Iron	.492	0.01	0.5	0	98.4%	90	110	0			
Lead	.494	0.005	0.5	0	98.8%	90	110	0			
Manganese	.489	0.005	0.5	0	97.8%	90	110	0			
Nickel	.494	0.005	0.5	0	98.8%	90	110	0			
Selenium	.489	0.005	0.5	0	97.8%	90	110	0			
Silver	.485	0.005	0.5	0	97.0%	90	110	0			
Titanium	.516	0.01	0.5	0	103.2%	90	110	0			
Vanadium	.493	0.005	0.5	0	98.6%	90	110	0			
Zinc	.485	0.005	0.5	0	97.0%	90	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203193
Project: PDX WAC/ Wacker Siltronics

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4035** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**
Client ID: **0203193** Run ID: **ICP_020326A** SeqNo: **113334**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	25.8	0.01	25	0	103.2%	90	110	0			
Magnesium	25.4	0.05	25	0	101.6%	90	110	0			
Titanium	5.04	0.01	5	0	100.8%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4035** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/22/02**
Client ID: **0203193** Run ID: **ICP_020326A** SeqNo: **113333**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.488	0.005	0.5	0	97.6%	95	105	0			
Arsenic, 200.7	.496	0.006	0.5	0	99.2%	95	105	0			
Barium, 200.7	.497	0.005	0.5	0	99.4%	95	105	0			
Chromium, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Cobalt, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Copper, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Iron, 200.7	.502	0.01	0.5	0	100.4%	95	105	0			
Lead, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			
Manganese, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Nickel, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Selenium, 200.7	.497	0.005	0.5	0	99.4%	95	105	0			
Silver, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Vanadium, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Zinc, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

ENVIRONMENTAL SERVICES LABORATORY – GLOSSARY OF FLAGS

QUALIFIER	DESCRIPTION
AA	This sample was analyzed after the holding time had expired.
AB	The hydrocarbon pattern in this sample is not typical of gasoline.
AC	The hydrocarbon pattern in this sample is not typical of diesel.
AD	The hydrocarbon pattern in this sample is not typical of oil.
AE	The hydrocarbon pattern in this sample extends into the gasoline range.
AF	The hydrocarbon pattern in this sample extends into the diesel range.
AG	The hydrocarbon pattern in this sample extends into the oil range.
A	This analysis was performed on a VOA sample containing headspace.
B	Analyte detected in the Method Blank above the reporting level.
C	The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
D	The sample was supplied in an inappropriate container according to method criteria.
E	This value is above the quantitation limit. It is considered an estimate.
H	The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
J	The result is above the Method Detection Limit (MDL) and below the Reporting level (RL). It is considered an estimate.
M	The MS/MSD recoveries are not calculable due to a high amount of analyte in sample.
MI	This indicates a high level of matrix interference affecting the spike or surrogate recovery.
N	See case narrative.
O	Detection Limits are elevated due to sample dilution. See case narrative.
Q	Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
R	The RPD result is outside method control limits. See other qualifiers or case narrative.
S	The spike recovery is outside method control limits. See other qualifiers or case narrative.
T	The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
X	Unable to quantitate surrogate recovery due to sample dilution.

Pg 1

Environmental Services Laboratory, Inc — CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

Company: Limno-Tech Inc
Project Manager: Kathi Futornick
Address: 4640 SW Macadam Ave, Ste 600
LABORATORY #: 0203193
Phone: 503-248-1768 Fax: 503-248-F159

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

	SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles	8270 GCMS Semivolatiles	8081 GC Pesticides/PCBs	8081m PCBs only	RCRA Metals (8)	Priority Pollutant Metals (13)	Metals: 3C: 7, 6B:	TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	Total Cy - (9010)	# OF CONTAINERS
FF	GP02-01 (34'-38')	3/20/02	08:30	W	01								3	X					X				X	6
FF	GP02-01 (56'-60')	3/20/02	09:50	W	02								3	X					X				X	6
FF	GP02-01 (96'-100')	3/20/02	10:45	W	03								3	X					X				X	6
VOF	Screen Rinse Blank	3/20/02	08:00	W	04								3	X					X				X	6
	Trip Blank	3/20/02	—	W	05								3											1
	~~GP02-02 ( )~~	~~3/20/02~~		S									✓	✓					✓				✓	~~3~~
	~~GP02-02 ( )~~	~~3/20/02~~		S									✓	✓					✓				✓	~~3~~
	~~GP02-02 ( )~~	~~3/20/02~~		S									✓	✓					✓				✓	~~3~~
FF	Duplicate	—	—	W	06								3	1					1				1	6
FF	Filter Blank	3/20/02	10:20	W	07														✓					1
VOC	Still Blank	3/20/02	08:15	W	08								3											3

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER: PDX WAC	TOTAL NUMBER OF CONTAINERS
PROJECT NAME: Wacker Siltronics	COC SEALS INTACT? Y / N / NA
PURCHASE ORDER NUMBER:	RECEIVED INTACT? Y / N
ONGOING PROJECT? YES ☒ NO ☐	RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS: VOC's (8260B), SVOC's (8270 SIM)
Total Cy (9010)
Metals: Sb, As, Ba, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Ti, Va, Zn (6010/7000) (245.1, 200.7)

Sampled by: Joyce S Dunham
Received via:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Christina Glastis Time 1600	SIGNATURE: Time	SIGNATURE: Time
Printed Name: Christina Glastis Date 3/19/02	Printed Name: Date	Printed Name: Date
Company:	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time 1600	Signature: Time	Signature: Time
Printed Name: D. Thomas Date 3/20/02	Printed Name: Date	Printed Name: Date
Company: ESL	Company:	ESL Inc.:

DISTRIBUTION: White, Canary - ESL, Pink - Originator

* pH test

SCOEPA00011786

Pg 2

Environmental Services Laboratory, Inc

CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

Company: Limno-Tech, I
Project Manager: Kathy Futornick
LABORATORY #: 0203193
Address: 4640 SW Macadam Suite 60 Portland
Phone: 503-248-1768 Fax: 503-248-1959

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

	SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles	8270 GCMS Semivolatiles	8081 GC Pesticides/PCBs	8081m PCBs only	RCRA Metals (8)	Priority Pollutant Metals (13)	Metals:	TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	TCLP	# OF CONTAINERS
FF	GP02-02 (23'-27')	3/20/02	13:45	W	09								W						1				1	6
	GP02-02 (21-4')	3/20/02	12:50	S	10								✓						✓				✓	3
	GP02-02 (18'-20')	3/20/02	13:10	S	11								✓						✓				✓	3
	GP02-02 (23'-25')	3/20/02	13:20	S	12								✓						✓				✓	3
	DUPLICATE	—	—	S	13								✓						✓				✓	3

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER:	TOTAL NUMBER OF CONTAINERS
PROJECT NAME:	COC SEALS INTACT? Y / N / NA
PURCHASE ORDER NUMBER:	RECEIVED INTACT? Y / N
ONGOING PROJECT? YES ☐ NO ☐	RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS: VOC's (8260B), SVOCS (8270SIM)
Total Cr (9010)
Metals: Sb, As, Ba, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni
Se, Ag, Ti Va, Zn (6010/7000)

Sampled by: Joyce Stankiewicz

Received via: (245.1, 200.7)

DISTRIBUTION: White, Canary - ESL, Pink - Originator

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Christina Clark Time 1600	SIGNATURE: Time	SIGNATURE: Time
Printed Name: Christina Clark Date 3/20	Printed Name: Date	Printed Name: Date
Company: Limno-Tech	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time 1600	Signature: Time	Signature: Time
Printed Name: D. Thomas Date 3/20/02	Printed Name: Date	Printed Name: Date
Company: ESL	Company:	ESL Inc.:

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

April 05, 2002

Kathi Futernick
Limno-Tech, Inc.
4640 SW Macadam Ave
Ste 60
Portland, OR 97201
TEL: (503) 248-1768
FAX (503) 248-1959

RE: Order No.: 0203212

Dear Kathi Futernick,

Environmental Services Laboratory received 8 samples on 3/21/02 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
- Cyanide (EPA 9010B)
- ICP Metals (EPA 200.7)
- ICP Metals (EPA 6010B)
- PAH BY SIM, Aqueous (8270-SIM)
- PAH BY SIM, Soil (8270-SIM)
- Volatiles by GC/MS (EPA 8260B)

Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓ Base Sample Report ✓ Method Blank Report ✓ Sample Duplicate Report
✓ Matrix Spike Report ✓ Laboratory Control Spike ✓ Continuing Calibration Verification Report ✓ Initial Calibration Verification Report
If you have any questions regarding these test results, please feel free to call.

Sincerely,

Leslie Rush
Leslie Rush
Project Manager

Keith Hunter
Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-01A

Client Sample ID: GP02-03 (3-5)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0800		mg/Kg	1	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	1.07	1.00		mg/Kg	1	3/27/02
Arsenic	3.12	1.00		mg/Kg	1	3/27/02
Barium	71.4	1.00		mg/Kg	1	3/27/02
Chromium	11.9	1.00		mg/Kg	1	3/27/02
Cobalt	13.0	1.00		mg/Kg	1	3/27/02
Copper	13.4	1.00		mg/Kg	1	3/27/02
Iron	23,800	4.00		mg/Kg	1	3/27/02
Lead	1.64	1.00		mg/Kg	1	3/27/02
Magnesium	3,010	10.0		mg/Kg	1	3/27/02
Manganese	253	1.00		mg/Kg	1	3/27/02
Nickel	14.5	1.00		mg/Kg	1	3/27/02
Selenium	ND	1.00		mg/Kg	1	3/27/02
Silver	ND	1.00		mg/Kg	1	3/27/02
Titanium	1,590	1.00		mg/Kg	1	3/27/02
Vanadium	66.0	1.00		mg/Kg	1	3/27/02
Zinc	43.0	1.00		mg/Kg	1	3/27/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-01A

Client Sample ID: GP02-03 (3-5)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **jlw**
1,1,1,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,1-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	3/29/02
1,2-Dibromoethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,4-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
2,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
2-Butanone	ND	100		µg/Kg	1	3/29/02
2-Chloroethyl vinyl ether	ND	50.0		µg/Kg	1	3/29/02
2-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
2-Hexanone	ND	100		µg/Kg	1	3/29/02
4-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
4-Isopropyltoluene	ND	5.00		µg/Kg	1	3/29/02
4-Methyl-2-pentanone	ND	5.00		µg/Kg	1	3/29/02
Acetone	ND	100		µg/Kg	1	3/29/02
Benzene	ND	5.00		µg/Kg	1	3/29/02
Bromobenzene	ND	5.00		µg/Kg	1	3/29/02
Bromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromodichloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromoform	ND	5.00		µg/Kg	1	3/29/02
Bromomethane	ND	10.0		µg/Kg	1	3/29/02
Carbon disulfide	ND	5.00		µg/Kg	1	3/29/02
Carbon tetrachloride	ND	5.00		µg/Kg	1	3/29/02
Chlorobenzene	ND	5.00		µg/Kg	1	3/29/02
Chloroethane	ND	10.0		µg/Kg	1	3/29/02
Chloroform	ND	5.00		µg/Kg	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-01A

Client Sample ID: GP02-03 (3-5)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	10.0		µg/Kg	1	3/29/02
cis-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
cis-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Dibromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Dibromomethane	ND	5.00		µg/Kg	1	3/29/02
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	3/29/02
Ethylbenzene	ND	5.00		µg/Kg	1	3/29/02
Hexachlorobutadiene	ND	5.00		µg/Kg	1	3/29/02
Iodomethane	ND	5.00		µg/Kg	1	3/29/02
Isopropylbenzene	ND	5.00		µg/Kg	1	3/29/02
m,p-Xylene	ND	10.0		µg/Kg	1	3/29/02
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	3/29/02
Methylene chloride	ND	100		µg/Kg	1	3/29/02
n-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
n-Propylbenzene	ND	5.00		µg/Kg	1	3/29/02
Naphthalene	ND	10.0		µg/Kg	1	3/29/02
o-Xylene	ND	5.00		µg/Kg	1	3/29/02
sec-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Styrene	ND	5.00		µg/Kg	1	3/29/02
tert-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Tetrachloroethene	ND	5.00		µg/Kg	1	3/29/02
Toluene	ND	5.00		µg/Kg	1	3/29/02
trans-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
trans-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Trichloroethene	ND	5.00		µg/Kg	1	3/29/02
Trichlorofluoromethane	ND	10.0		µg/Kg	1	3/29/02
Vinyl acetate	ND	5.00		µg/Kg	1	3/29/02
Vinyl chloride	ND	10.0		µg/Kg	1	3/29/02
Surr: 4-Bromofluorobenzene	114.8	74-121		%REC	1	3/29/02
Surr: Dibromofluoromethane	102.4	80-120		%REC	1	3/29/02
Surr: Toluene-d8	106.2	81-117		%REC	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-01A

Client Sample ID: GP02-03 (3-5)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	50.0		µg/Kg	1	3/25/02
Acenaphthylene	65.0	50.0		µg/Kg	1	3/25/02
Anthracene	110	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	280	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	435	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	265	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	445	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	260	50.0		µg/Kg	1	3/25/02
Chrysene	485	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	75.0	50.0		µg/Kg	1	3/25/02
Fluoranthene	640	50.0		µg/Kg	1	3/25/02
Fluorene	ND	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	305	50.0		µg/Kg	1	3/25/02
Naphthalene	ND	50.0		µg/Kg	1	3/25/02
Phenanthrene	70.0	50.0		µg/Kg	1	3/25/02
Pyrene	630	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	128.0	30-115	S, MI	%REC	1	3/25/02
Surr: 4-Terphenyl-d14	124.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	100.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-02A

Client Sample ID: GP02-03 (24-26)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	5.62	0.400		mg/Kg	5	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	ND	1.00		mg/Kg	1	3/27/02
Arsenic	2.39	1.00		mg/Kg	1	3/27/02
Barium	91.7	1.00		mg/Kg	1	3/27/02
Chromium	15.7	1.00		mg/Kg	1	3/27/02
Cobalt	12.1	1.00		mg/Kg	1	3/27/02
Copper	14.5	1.00		mg/Kg	1	3/27/02
Iron	24,100	4.00		mg/Kg	1	3/27/02
Lead	4.48	1.00		mg/Kg	1	3/27/02
Magnesium	3,090	10.0		mg/Kg	1	3/27/02
Manganese	215	1.00		mg/Kg	1	3/27/02
Nickel	36.2	1.00		mg/Kg	1	3/27/02
Selenium	ND	1.00		mg/Kg	1	3/27/02
Silver	ND	1.00		mg/Kg	1	3/27/02
Titanium	1,320	1.00		mg/Kg	1	3/27/02
Vanadium	129	1.00		mg/Kg	1	3/27/02
Zinc	44.3	1.00		mg/Kg	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-02A

Client Sample ID: GP02-03 (24-26)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,1-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	3/29/02
1,2-Dibromoethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,4-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
2,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
2-Butanone	ND	100		µg/Kg	1	3/29/02
2-Chloroethyl vinyl ether	ND	50.0		µg/Kg	1	3/29/02
2-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
2-Hexanone	ND	100		µg/Kg	1	3/29/02
4-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
4-Isopropyltoluene	ND	5.00		µg/Kg	1	3/29/02
4-Methyl-2-pentanone	ND	5.00		µg/Kg	1	3/29/02
Acetone	ND	100		µg/Kg	1	3/29/02
Benzene	ND	5.00		µg/Kg	1	3/29/02
Bromobenzene	ND	5.00		µg/Kg	1	3/29/02
Bromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromodichloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromoform	ND	5.00		µg/Kg	1	3/29/02
Bromomethane	ND	10.0		µg/Kg	1	3/29/02
Carbon disulfide	ND	5.00		µg/Kg	1	3/29/02
Carbon tetrachloride	ND	5.00		µg/Kg	1	3/29/02
Chlorobenzene	ND	5.00		µg/Kg	1	3/29/02
Chloroethane	ND	10.0		µg/Kg	1	3/29/02
Chloroform	ND	5.00		µg/Kg	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-02A

Client Sample ID: GP02-03 (24-26)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	10.0		µg/Kg	1	3/29/02
cis-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
cis-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Dibromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Dibromomethane	ND	5.00		µg/Kg	1	3/29/02
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	3/29/02
Ethylbenzene	ND	5.00		µg/Kg	1	3/29/02
Hexachlorobutadiene	ND	5.00		µg/Kg	1	3/29/02
Iodomethane	ND	5.00		µg/Kg	1	3/29/02
Isopropylbenzene	ND	5.00		µg/Kg	1	3/29/02
m,p-Xylene	ND	10.0		µg/Kg	1	3/29/02
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	3/29/02
Methylene chloride	ND	100		µg/Kg	1	3/29/02
n-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
n-Propylbenzene	ND	5.00		µg/Kg	1	3/29/02
Naphthalene	44.6	10.0		µg/Kg	1	3/29/02
o-Xylene	ND	5.00		µg/Kg	1	3/29/02
sec-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Styrene	ND	5.00		µg/Kg	1	3/29/02
tert-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Tetrachloroethene	ND	5.00		µg/Kg	1	3/29/02
Toluene	ND	5.00		µg/Kg	1	3/29/02
trans-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
trans-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Trichloroethene	ND	5.00		µg/Kg	1	3/29/02
Trichlorofluoromethane	ND	10.0		µg/Kg	1	3/29/02
Vinyl acetate	ND	5.00		µg/Kg	1	3/29/02
Vinyl chloride	ND	10.0		µg/Kg	1	3/29/02
Surr: 4-Bromofluorobenzene	115.4	74-121		%REC	1	3/29/02
Surr: Dibromofluoromethane	104.6	80-120		%REC	1	3/29/02
Surr: Toluene-d8	108.2	81-117		%REC	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-02A

Client Sample ID: GP02-03 (24-26)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	385	50.0		µg/Kg	1	3/25/02
Acenaphthylene	225	50.0		µg/Kg	1	3/25/02
Anthracene	705	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	3,100	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	4,070	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	2,450	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	3,500	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	2,420	50.0		µg/Kg	1	3/25/02
Chrysene	4,440	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	650	50.0		µg/Kg	1	3/25/02
Fluoranthene	4,450	50.0		µg/Kg	1	3/25/02
Fluorene	325	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	2,560	50.0		µg/Kg	1	3/25/02
Naphthalene	385	50.0		µg/Kg	1	3/25/02
Phenanthrene	3,300	50.0		µg/Kg	1	3/25/02
Pyrene	5,450	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	127.0	30-115	S, MI	%REC	1	3/25/02
Surr: 4-Terphenyl-d14	122.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	119.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-03A

Client Sample ID: GP02-03 (22-24)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	7.03	0.400		mg/Kg	5	3/26/02
ICP METALS		**EPA 6010B**				Analyst: **mal**
Antimony	1.31	1.00		mg/Kg	1	3/27/02
Arsenic	4.33	1.00		mg/Kg	1	3/27/02
Barium	112	1.00		mg/Kg	1	3/27/02
Chromium	19.5	1.00		mg/Kg	1	3/27/02
Cobalt	12.9	1.00		mg/Kg	1	3/27/02
Copper	20.0	1.00		mg/Kg	1	3/27/02
Iron	29,800	4.00		mg/Kg	1	3/27/02
Lead	21.4	1.00		mg/Kg	1	3/27/02
Magnesium	3,400	10.0		mg/Kg	1	3/27/02
Manganese	363	1.00		mg/Kg	1	3/27/02
Nickel	16.1	1.00		mg/Kg	1	3/27/02
Selenium	ND	1.00		mg/Kg	1	3/27/02
Silver	ND	1.00		mg/Kg	1	3/27/02
Titanium	1,740	1.00		mg/Kg	1	3/27/02
Vanadium	81.7	1.00		mg/Kg	1	3/27/02
Zinc	106	1.00		mg/Kg	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-03A

Client Sample ID: GP02-03 (22-24)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: jlw
1,1,1,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,1-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2,2-Tetrachloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1,2-Trichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
1,1-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,3-Trichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2,4-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	3/29/02
1,2-Dibromoethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloroethane	ND	5.00		µg/Kg	1	3/29/02
1,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,3,5-Trimethylbenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
1,3-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
1,4-Dichlorobenzene	ND	5.00		µg/Kg	1	3/29/02
2,2-Dichloropropane	ND	5.00		µg/Kg	1	3/29/02
2-Butanone	ND	100		µg/Kg	1	3/29/02
2-Chloroethyl vinyl ether	ND	50.0		µg/Kg	1	3/29/02
2-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
2-Hexanone	ND	100		µg/Kg	1	3/29/02
4-Chlorotoluene	ND	5.00		µg/Kg	1	3/29/02
4-Isopropyltoluene	ND	5.00		µg/Kg	1	3/29/02
4-Methyl-2-pentanone	ND	5.00		µg/Kg	1	3/29/02
Acetone	ND	100		µg/Kg	1	3/29/02
Benzene	ND	5.00		µg/Kg	1	3/29/02
Bromobenzene	ND	5.00		µg/Kg	1	3/29/02
Bromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromodichloromethane	ND	5.00		µg/Kg	1	3/29/02
Bromoform	ND	5.00		µg/Kg	1	3/29/02
Bromomethane	ND	10.0		µg/Kg	1	3/29/02
Carbon disulfide	ND	5.00		µg/Kg	1	3/29/02
Carbon tetrachloride	ND	5.00		µg/Kg	1	3/29/02
Chlorobenzene	ND	5.00		µg/Kg	1	3/29/02
Chloroethane	ND	10.0		µg/Kg	1	3/29/02
Chloroform	ND	5.00		µg/Kg	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-03A

Client Sample ID: GP02-03 (22-24)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	10.0		µg/Kg	1	3/29/02
cis-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
cis-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Dibromochloromethane	ND	5.00		µg/Kg	1	3/29/02
Dibromomethane	ND	5.00		µg/Kg	1	3/29/02
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	3/29/02
Ethylbenzene	ND	5.00		µg/Kg	1	3/29/02
Hexachlorobutadiene	ND	5.00		µg/Kg	1	3/29/02
Iodomethane	ND	5.00		µg/Kg	1	3/29/02
Isopropylbenzene	ND	5.00		µg/Kg	1	3/29/02
m,p-Xylene	ND	10.0		µg/Kg	1	3/29/02
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	3/29/02
Methylene chloride	ND	100		µg/Kg	1	3/29/02
n-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
n-Propylbenzene	ND	5.00		µg/Kg	1	3/29/02
Naphthalene	17.2	10.0		µg/Kg	1	3/29/02
o-Xylene	ND	5.00		µg/Kg	1	3/29/02
sec-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Styrene	ND	5.00		µg/Kg	1	3/29/02
tert-Butylbenzene	ND	5.00		µg/Kg	1	3/29/02
Tetrachloroethene	ND	5.00		µg/Kg	1	3/29/02
Toluene	ND	5.00		µg/Kg	1	3/29/02
trans-1,2-Dichloroethene	ND	5.00		µg/Kg	1	3/29/02
trans-1,3-Dichloropropene	ND	5.00		µg/Kg	1	3/29/02
Trichloroethene	ND	5.00		µg/Kg	1	3/29/02
Trichlorofluoromethane	ND	10.0		µg/Kg	1	3/29/02
Vinyl acetate	ND	5.00		µg/Kg	1	3/29/02
Vinyl chloride	ND	10.0		µg/Kg	1	3/29/02
Surr: 4-Bromofluorobenzene	126.6	74-121	S	%REC	1	3/29/02
Surr: Dibromofluoromethane	113.4	80-120		%REC	1	3/29/02
Surr: Toluene-d8	111.0	81-117		%REC	1	3/29/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-03A

Client Sample ID: GP02-03 (22-24)
Tag Number:
Collection Date: 3/21/02
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		**8270-SIM**				Analyst: **mrs**
Acenaphthene	165	50.0		µg/Kg	1	3/25/02
Acenaphthylene	120	50.0		µg/Kg	1	3/25/02
Anthracene	265	50.0		µg/Kg	1	3/25/02
Benz(a)anthracene	530	50.0		µg/Kg	1	3/25/02
Benzo(a)pyrene	750	50.0		µg/Kg	1	3/25/02
Benzo(b)fluoranthene	505	50.0		µg/Kg	1	3/25/02
Benzo(g,h,i)perylene	725	50.0		µg/Kg	1	3/25/02
Benzo(k)fluoranthene	440	50.0		µg/Kg	1	3/25/02
Chrysene	865	50.0		µg/Kg	1	3/25/02
Dibenz(a,h)anthracene	125	50.0		µg/Kg	1	3/25/02
Fluoranthene	1,270	50.0		µg/Kg	1	3/25/02
Fluorene	70.0	50.0		µg/Kg	1	3/25/02
Indeno(1,2,3-cd)pyrene	505	50.0		µg/Kg	1	3/25/02
Naphthalene	70.0	50.0		µg/Kg	1	3/25/02
Phenanthrene	645	50.0		µg/Kg	1	3/25/02
Pyrene	1,900	50.0		µg/Kg	1	3/25/02
Surr: 2-Fluorobiphenyl	115.0	30-115		%REC	1	3/25/02
Surr: 4-Terphenyl-d14	127.0	18-137		%REC	1	3/25/02
Surr: Nitrobenzene-d5	81.0	23-120		%REC	1	3/25/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-04A

Client Sample ID: GP02-02(56-60)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	1.01	0.0800		mg/L	2	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7 Diss	0.00780	0.00600		mg/L	1	3/28/02
Barium, 200.7 Diss	0.0749	0.00500		mg/L	1	3/28/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7 Diss	64.2	0.0100		mg/L	1	3/28/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7 Diss	73.6	0.0500		mg/L	1	3/28/02
Manganese, 200.7 Diss	12.6	0.0100		mg/L	1	3/28/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7 Diss	0.00980	0.00500		mg/L	1	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-04A

Client Sample ID: GP02-02(56-60)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	250		µg/L	250	3/30/02
1,1,1-Trichloroethane	ND	250		µg/L	250	3/30/02
1,1,2,2-Tetrachloroethane	ND	250		µg/L	250	3/30/02
1,1,2-Trichloroethane	ND	250		µg/L	250	3/30/02
1,1-Dichloroethane	ND	375		µg/L	250	3/30/02
1,1-Dichloroethene	ND	250		µg/L	250	3/30/02
1,1-Dichloropropene	ND	250		µg/L	250	3/30/02
1,2,3-Trichlorobenzene	ND	450		µg/L	250	3/30/02
1,2,3-Trichloropropane	ND	250		µg/L	250	3/30/02
1,2,4-Trichlorobenzene	ND	250		µg/L	250	3/30/02
1,2,4-Trimethylbenzene	ND	250		µg/L	250	3/30/02
1,2-Dibromo-3-chloropropane	ND	500		µg/L	250	3/30/02
1,2-Dibromoethane	ND	250		µg/L	250	3/30/02
1,2-Dichlorobenzene	ND	250		µg/L	250	3/30/02
1,2-Dichloroethane	ND	250		µg/L	250	3/30/02
1,2-Dichloropropane	ND	250		µg/L	250	3/30/02
1,3,5-Trimethylbenzene	ND	250		µg/L	250	3/30/02
1,3-Dichlorobenzene	ND	250		µg/L	250	3/30/02
1,3-Dichloropropane	ND	250		µg/L	250	3/30/02
1,4-Dichlorobenzene	ND	250		µg/L	250	3/30/02
2,2-Dichloropropane	ND	475		µg/L	250	3/30/02
2-Butanone	ND	5,000		µg/L	250	3/30/02
2-Chloroethyl vinyl ether	ND	1,250		µg/L	250	3/30/02
2-Chlorotoluene	ND	250		µg/L	250	3/30/02
2-Hexanone	ND	5,000		µg/L	250	3/30/02
4-Chlorotoluene	ND	250		µg/L	250	3/30/02
4-Isopropyltoluene	ND	250		µg/L	250	3/30/02
4-Methyl-2-pentanone	ND	250		µg/L	250	3/30/02
Acetone	ND	5,000		µg/L	250	3/30/02
Benzene	1,060	250		µg/L	250	3/30/02
Bromobenzene	ND	250		µg/L	250	3/30/02
Bromochloromethane	ND	250		µg/L	250	3/30/02
Bromodichloromethane	ND	250		µg/L	250	3/30/02
Bromoform	ND	250		µg/L	250	3/30/02
Bromomethane	ND	1,250		µg/L	250	3/30/02
Carbon disulfide	ND	250		µg/L	250	3/30/02
Carbon tetrachloride	ND	250		µg/L	250	3/30/02
Chlorobenzene	ND	250		µg/L	250	3/30/02
Chloroethane	ND	1,250		µg/L	250	3/30/02
Chloroform	ND	250		µg/L	250	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-04A

Client Sample ID: GP02-02(56-60)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	500		µg/L	250	3/30/02
cis-1,2-Dichloroethene	57,900	1,000		µg/L	250	3/30/02
cis-1,3-Dichloropropene	ND	250		µg/L	250	3/30/02
Dibromochloromethane	ND	250		µg/L	250	3/30/02
Dibromomethane	ND	250		µg/L	250	3/30/02
Dichlorodifluoromethane	ND	500		µg/L	250	3/30/02
Ethylbenzene	ND	250		µg/L	250	3/30/02
Hexachlorobutadiene	ND	500		µg/L	250	3/30/02
Iodomethane	ND	1,250		µg/L	250	3/30/02
Isopropylbenzene	ND	250		µg/L	250	3/30/02
m,p-Xylene	ND	500		µg/L	250	3/30/02
Methyl tert-butyl ether	ND	500		µg/L	250	3/30/02
Methylene chloride	ND	5,000		µg/L	250	3/30/02
n-Butylbenzene	ND	250		µg/L	250	3/30/02
n-Propylbenzene	ND	250		µg/L	250	3/30/02
Naphthalene	2,160	500		µg/L	250	3/30/02
o-Xylene	ND	250		µg/L	250	3/30/02
sec-Butylbenzene	ND	250		µg/L	250	3/30/02
Styrene	ND	250		µg/L	250	3/30/02
tert-Butylbenzene	ND	250		µg/L	250	3/30/02
Tetrachloroethene	ND	250		µg/L	250	3/30/02
Toluene	ND	250		µg/L	250	3/30/02
trans-1,2-Dichloroethene	ND	250		µg/L	250	3/30/02
trans-1,3-Dichloropropene	ND	250		µg/L	250	3/30/02
Trichloroethene	21,000	250		µg/L	250	3/30/02
Trichlorofluoromethane	ND	500		µg/L	250	3/30/02
Vinyl acetate	ND	250		µg/L	250	3/30/02
Vinyl chloride	ND	300		µg/L	250	3/30/02
Surr: 4-Bromofluorobenzene	105.2	86-115		%REC	250	3/30/02
Surr: Dibromofluoromethane	101.2	86-118		%REC	250	3/30/02
Surr: Toluene-d8	101.4	88-110		%REC	250	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-04A

Client Sample ID: GP02-02(56-60)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	4.24	0.100		µg/L	1	3/27/02
Acenaphthylene	0.840	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	0.110	0.100		µg/L	1	3/27/02
Fluorene	0.220	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	1,030	0.100		µg/L	1	3/27/02
Phenanthrene	0.200	0.100		µg/L	1	3/27/02
Pyrene	0.110	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	49.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	64.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	50.0	35-114		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-05A

Client Sample ID: GP02-02(96-100)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7 Diss	0.00730	0.00600		mg/L	1	3/28/02
Barium, 200.7 Diss	0.0538	0.00500		mg/L	1	3/28/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7 Diss	47.6	0.0100		mg/L	1	3/28/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7 Diss	26.2	0.0500		mg/L	1	3/28/02
Manganese, 200.7 Diss	4.77	0.00500		mg/L	1	3/28/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7 Diss	0.0183	0.00500		mg/L	1	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-05A

Client Sample ID: GP02-02(96-100)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	171	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	2.92	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	122	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-05A

Client Sample ID: GP02-02(96-100)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	975	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	192	2.00		µg/L	1	3/30/02
Ethylbenzene	47.8	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	31.4	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	302	2.00		µg/L	1	3/30/02
o-Xylene	19.9	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	43.1	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	575,000	10,000		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	25.4	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	108.4	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	99.8	86-118		%REC	1	3/30/02
Surr: Toluene-d8	112.6	88-110	S	%REC	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-05A

Client Sample ID: GP02-02(96-100)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	ND	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	145	0.100		µg/L	1	3/27/02
Phenanthrene	0.200	0.100		µg/L	1	3/27/02
Pyrene	ND	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	56.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	66.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	29.0	35-114	S, MI	%REC	1	3/27/02

Qualifiers:

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J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-06A

Client Sample ID: Field Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	ND	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7	ND	0.00600		mg/L	1	3/28/02
Barium, 200.7	ND	0.00500		mg/L	1	3/28/02
Chromium, 200.7	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7	ND	0.00500		mg/L	1	3/28/02
Copper, 200.7	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7	0.0339	0.0100		mg/L	1	3/28/02
Lead, 200.7	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7	ND	0.0500		mg/L	1	3/28/02
Manganese, 200.7	ND	0.00500		mg/L	1	3/28/02
Nickel, 200.7	ND	0.00500		mg/L	1	3/28/02
Selenium, 200.7	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7	ND	0.00500		mg/L	1	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-06A

Client Sample ID: Field Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-06A

Client Sample ID: Field Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	ND	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	116.4	86-115	S	%REC	1	3/30/02
Surr: Dibromofluoromethane	105.6	86-118		%REC	1	3/30/02
Surr: Toluene-d8	105.0	88-110		%REC	1	3/30/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-06A

Client Sample ID: Field Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	ND	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	ND	0.100		µg/L	1	3/27/02
Phenanthrene	ND	0.100		µg/L	1	3/27/02
Pyrene	ND	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	57.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	79.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	51.0	35-114		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-07A

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-07A

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	ND	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	110.0	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	102.4	86-118		%REC	1	3/30/02
Surr: Toluene-d8	102.6	88-110		%REC	1	3/30/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-08A

Client Sample ID: GP02-03(31-35)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **jca**
Cyanide	0.276	0.0400		mg/L	1	3/22/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7 Diss	ND	0.00600		mg/L	1	3/28/02
Barium, 200.7 Diss	0.0620	0.00500		mg/L	1	3/28/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7 Diss	0.0117	0.00500		mg/L	1	3/28/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7 Diss	1.61	0.0100		mg/L	1	3/28/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7 Diss	54.0	0.0500		mg/L	1	3/28/02
Manganese, 200.7 Diss	6.53	0.00500		mg/L	1	3/28/02
Nickel, 200.7 Diss	0.0125	0.00500		mg/L	1	3/28/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7 Diss	0.0348	0.00500		mg/L	1	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-08A

Client Sample ID: GP02-03(31-35)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-08A

Client Sample ID: GP02-03(31-35)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	4.29	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	110.2	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	102.6	86-118		%REC	1	3/30/02
Surr: Toluene-d8	103.0	88-110		%REC	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203212
Project:
Lab ID: 0203212-08A

Client Sample ID: GP02-03(31-35)
Tag Number:
Collection Date: 3/21/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	0.190	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	0.380	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	0.940	0.100		µg/L	1	3/27/02
Phenanthrene	0.310	0.100		µg/L	1	3/27/02
Pyrene	0.490	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	51.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	69.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	44.0	35-114		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Method Blank

Sample ID: **MBlank** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203212** Run ID: **HIT MAN_020322B** SeqNo: **112916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Sample ID: **MBlank** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **HIT MAN_020326A** SeqNo: **113193**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020401A** SeqNo: **114077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	55.8	0	50	0	111.6%	86	115	0
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0
Toluene-d8	51.4	0	50	0	102.8%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020330A** SeqNo: **114149**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	51.1	0	50	0	102.2%	86	115	0
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0
Toluene-d8	49.7	0	50	0	99.4%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203212** Run ID: **ANGSTROM_020329A** SeqNo: **113945**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	5									
1,1,1-Trichloroethane	ND	5									
1,1,2,2-Tetrachloroethane	ND	5									
1,1,2-Trichloroethane	ND	5									
1,1-Dichloroethane	ND	5									
1,1-Dichloroethene	ND	5									
1,1-Dichloropropene	ND	5									
1,2,3-Trichlorobenzene	ND	5									
1,2,3-Trichloropropane	ND	5									
1,2,4-Trichlorobenzene	ND	5									
1,2,4-Trimethylbenzene	ND	5									
1,2-Dibromo-3-chloropropane	ND	10									
1,2-Dibromoethane	ND	5									
1,2-Dichlorobenzene	ND	5									
1,2-Dichloroethane	ND	5									
1,2-Dichloropropane	ND	5									
1,3,5-Trimethylbenzene	ND	5									
1,3-Dichlorobenzene	ND	5									
1,3-Dichloropropane	ND	5									
1,4-Dichlorobenzene	ND	5									
2,2-Dichloropropane	ND	5									
2-Butanone	ND	100									
2-Chloroethyl vinyl ether	ND	50									
2-Chlorotoluene	ND	5									
2-Hexanone	ND	100									
4-Chlorotoluene	ND	5									
4-Isopropyltoluene	ND	5									
4-Methyl-2-pentanone	ND	5									
Acetone	ND	100									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Benzene	ND	5
Bromobenzene	ND	5
Bromochloromethane	ND	5
Bromodichloromethane	ND	5
Bromoform	ND	5
Bromomethane	ND	10
Carbon disulfide	ND	5
Carbon tetrachloride	ND	5
Chlorobenzene	ND	5
Chloroethane	ND	10
Chloroform	ND	5
Chloromethane	ND	10
cis-1,2-Dichloroethene	ND	5
cis-1,3-Dichloropropene	ND	5
Dibromochloromethane	ND	5
Dibromomethane	ND	5
Dichlorodifluoromethane	ND	10
Ethylbenzene	ND	5
Hexachlorobutadiene	ND	5
Iodomethane	ND	5
Isopropylbenzene	ND	5
m,p-Xylene	ND	10
Methyl tert-butyl ether	ND	10
Methylene chloride	ND	100
n-Butylbenzene	ND	5
n-Propylbenzene	ND	5
Naphthalene	ND	10
o-Xylene	ND	5
sec-Butylbenzene	ND	5
Styrene	ND	5
tert-Butylbenzene	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	5						
trans-1,3-Dichloropropene	ND	5						
Trichloroethene	ND	5						
Trichlorofluoromethane	ND	10						
Vinyl acetate	ND	5						
Vinyl chloride	ND	10						
4-Bromofluorobenzene	55	0	50	0	110.0%	86	115	0
Dibromofluoromethane	56	0	50	0	112.0%	86	118	0
Toluene-d8	54	0	50	0	108.0%	88	110	0

Sample ID: **MB-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									
2-Fluorobiphenyl	570	0	500	0	114.0%	30	115	0			
4-Terphenyl-d14	680	0	500	0	136.0%	18	137	0			
Nitrobenzene-d5	540	0	500	0	108.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-4038** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/27/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **ICP_020327A** SeqNo: **113402**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Barium	ND	1									
Chromium	ND	1									
Cobalt	ND	1									
Copper	ND	1									
Iron	ND	2									
Lead	ND	1									
Magnesium	ND	10									
Manganese	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Titanium	ND	1									
Vanadium	ND	1									
Zinc	ND	1									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **MANFREDD_020327A** SeqNo: **113500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.1									
Acenaphthylene	ND	0.1									
Anthracene	ND	0.1									
Benz(a)anthracene	ND	0.1									
Benzo(a)pyrene	ND	0.1									
Benzo(b)fluoranthene	ND	0.1									
Benzo(g,h,i)perylene	ND	0.1									
Benzo(k)fluoranthene	ND	0.1									
Chrysene	ND	0.1									
Dibenz(a,h)anthracene	ND	0.1									
Fluoranthene	ND	0.1									
Fluorene	ND	0.1									
Indeno(1,2,3-cd)pyrene	ND	0.1									
Naphthalene	ND	0.1									
Phenanthrene	ND	0.1									
Pyrene	ND	0.1									
2-Fluorobiphenyl	.61	0	1	0	61.0%	43	116	0			
4-Terphenyl-d14	.81	0	1	0	81.0%	33	141	0			
Nitrobenzene-d5	.55	0	1	0	55.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203193-02A DUP** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203212** Run ID: **HIT MAN_020322B** SeqNo: **112921**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04	0	0	0.0%	0	0	0	0.0%	20	

Sample ID: **0203188-01A DUP** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **HIT MAN_020326A** SeqNo: **113196**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.08	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011831

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203200-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020330A** SeqNo: **114153**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	0	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	52.6	0	50	0	105.2%	86	115	0	0.0%	0
Dibromofluoromethane	51.8	0	50	0	103.6%	86	118	0	0.0%	0
Toluene-d8	49.5	0	50	0	99.0%	88	110	0	0.0%	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203221-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020401A** SeqNo: **114085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	22.7	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	54.4	0	50	0	108.8%	86	115	0	0.0%	0
Dibromofluoromethane	51.1	0	50	0	102.2%	86	118	0	0.0%	0
Toluene-d8	51.3	0	50	0	102.6%	88	110	0	0.0%	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011837

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-11A DUP** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **0203212** Run ID: **ANGSTROM_020329A** SeqNo: **113949**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	400	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	200	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	400	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	400	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromochloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromodichloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromoform	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Bromomethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Carbon disulfide	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Carbon tetrachloride	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chlorobenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chloroethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Chloroform	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Chloromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
cis-1,2-Dichloroethene	39.6	20	0	0	0.0%	0	0	64.4	47.7%	20	R, Q
cis-1,3-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dibromochloromethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dibromomethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Dichlorodifluoromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Ethylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Hexachlorobutadiene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Iodomethane	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Isopropylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
m,p-Xylene	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Methyl tert-butyl ether	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Methylene chloride	ND	400	0	0	0.0%	0	0	0	0.0%	20	
n-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
n-Propylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Naphthalene	492	40	0	0	0.0%	0	0	428	13.9%	20	
o-Xylene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
sec-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Styrene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
tert-Butylbenzene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Tetrachloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Toluene	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011839

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
trans-1,3-Dichloropropene	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Trichloroethene	1596	20	0	0	0.0%	0	0	1968	20.9%	20	R, Q
Trichlorofluoromethane	ND	40	0	0	0.0%	0	0	0	0.0%	20	
Vinyl acetate	ND	20	0	0	0.0%	0	0	0	0.0%	20	
Vinyl chloride	ND	40	0	0	0.0%	0	0	0	0.0%	20	
4-Bromofluorobenzene	224.8	0	200	0	112.4%	74	121	0	0.0%	0	
Dibromofluoromethane	200	0	200	0	100.0%	80	120	0	0.0%	0	
Toluene-d8	209.6	0	200	0	104.8%	81	117	0	0.0%	0	

Sample ID: **0203188-01A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benz(a)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(a)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(b)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(g,h,i)perylene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Benzo(k)fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Chrysene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Dibenz(a,h)anthracene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluoranthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Naphthalene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Phenanthrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Pyrene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	495	0	500	0	99.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203193-11A DUP** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113349**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Acenaphthylene	55	50	0	0	0.0%	0	0	50	9.5%	30	
Anthracene	75	50	0	0	0.0%	0	0	75	0.0%	30	
Benz(a)anthracene	255	50	0	0	0.0%	0	0	275	7.5%	30	
Benzo(a)pyrene	465	50	0	0	0.0%	0	0	440	5.5%	30	
Benzo(b)fluoranthene	245	50	0	0	0.0%	0	0	235	4.2%	30	
Benzo(g,h,i)perylene	435	50	0	0	0.0%	0	0	405	7.1%	30	
Benzo(k)fluoranthene	235	50	0	0	0.0%	0	0	270	13.9%	30	
Chrysene	410	50	0	0	0.0%	0	0	395	3.7%	30	
Dibenz(a,h)anthracene	75	50	0	0	0.0%	0	0	70	6.9%	30	
Fluoranthene	560	50	0	0	0.0%	0	0	675	18.6%	30	
Fluorene	ND	50	0	0	0.0%	0	0	0	0.0%	30	
Indeno(1,2,3-cd)pyrene	305	50	0	0	0.0%	0	0	285	6.8%	30	
Naphthalene	50	50	0	0	0.0%	0	0	0	200.0%	30	R, T
Phenanthrene	110	50	0	0	0.0%	0	0	160	37.0%	30	R, T
Pyrene	595	50	0	0	0.0%	0	0	690	14.8%	30	
2-Fluorobiphenyl	650	0	500	0	130.0%	30	115	0	0.0%	30	S, MI
4-Terphenyl-d14	635	0	500	0	127.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	600	0	500	0	120.0%	23	120	0	0.0%	30	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203212-02A DUP** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/27/02** Prep Date: **3/25/02**

Client ID: **GP02-03 (24-26)** **0203212** Run ID: **ICP_020327A** SeqNo: **113408**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Arsenic	2.49	1	0	0	0.0%	0	0	2.39	4.1%	20	
Barium	85.8	1	0	0	0.0%	0	0	91.7	6.6%	20	
Chromium	16.7	1	0	0	0.0%	0	0	15.7	6.2%	20	
Cobalt	12.5	1	0	0	0.0%	0	0	12.1	3.3%	20	
Copper	15.3	1	0	0	0.0%	0	0	14.5	5.4%	20	
Iron	26500	4	0	0	0.0%	0	0	24100	9.5%	20	
Lead	4.41	1	0	0	0.0%	0	0	4.48	1.6%	20	
Magnesium	3210	10	0	0	0.0%	0	0	3090	3.8%	20	
Manganese	224	1	0	0	0.0%	0	0	215	4.1%	20	
Nickel	29.7	1	0	0	0.0%	0	0	36.2	19.7%	20	
Selenium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Silver	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Titanium	1440	1	0	0	0.0%	0	0	1320	8.7%	20	
Vanadium	122	1	0	0	0.0%	0	0	129	5.6%	20	
Zinc	46.1	1	0	0	0.0%	0	0	44.3	4.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203216-02A DUP** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113787**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Arsenic, 200.7 Diss	ND	0.006	0	0	0.0%	0	0	0	0.0%	20	
Barium, 200.7 Diss	.0878	0.005	0	0	0.0%	0	0	0.0871	0.8%	20	
Chromium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Cobalt, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Copper, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Iron, 200.7 Diss	47.8	0.01	0	0	0.0%	0	0	47.2	1.3%	20	
Lead, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Magnesium, 200.7 Diss	35.7	0.05	0	0	0.0%	0	0	35.3	1.1%	20	
Manganese, 200.7 Diss	3.15	0.005	0	0	0.0%	0	0	3.11	1.3%	20	
Nickel, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Selenium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Silver, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Titanium, 200.7	ND	0.01	0	0	0.0%	0	0	0	0.0%	20	
Vanadium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Zinc, 200.7 Diss	.0186	0.005	0	0	0.0%	0	0	0.0188	1.1%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203193-01A MS** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203212** Run ID: **HIT MAN_020322B** SeqNo: **112919**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	4.96	0.2	0.5	4.41	110.0%	75	125	0			

Sample ID: **0203188-02A MS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **HIT MAN_020326A** SeqNo: **113198**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.836	0.08	0.2	0.34	124.0%	75	125	0			

Sample ID: **0203200-09A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020330A** SeqNo: **114155**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	33.9	1	40	0	84.7%	0	234	0			
Benzene	39.4	1	40	0	98.5%	37	151	0			
Chlorobenzene	37.2	1	40	0	93.0%	37	160	0			
Toluene	38	1	40	0	95.0%	47	150	0			
Trichloroethene	41.2	1	40	2.55	96.6%	71	157	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	50.2	0	50	0	100.4%	86	118	0			
Toluene-d8	50.7	0	50	0	101.4%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203221-07A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020401A** SeqNo: **114083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	8.42	1	10	0	84.2%	0	234	0			
Benzene	10.7	1	10	0	107.0%	37	151	0			
Chlorobenzene	10.1	1	10	0	101.0%	37	160	0			
Toluene	10.1	1	10	0	101.0%	47	150	0			
Trichloroethene	10.6	1	10	0	106.0%	71	157	0			
4-Bromofluorobenzene	53.8	0	50	0	107.6%	86	115	0			
Dibromofluoromethane	52.4	0	50	0	104.8%	86	118	0			
Toluene-d8	52.5	0	50	0	105.0%	88	110	0			

Sample ID: **0203212-03A MS** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:
Client ID: **GP02-03 (22-24)** **0203212** Run ID: **ANGSTROM_020329A** SeqNo: **113955**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	210	5	200	0	105.0%	0	234	0			
Benzene	194	5	200	0	97.0%	37	151	0			
Chlorobenzene	153	5	200	0	76.5%	37	160	0			
Toluene	202	5	200	0	101.0%	47	150	0			
Trichloroethene	195	5	200	0	97.5%	71	157	0			
4-Bromofluorobenzene	52.3	0	50	0	104.6%	74	121	0			
Dibromofluoromethane	56.1	0	50	0	112.2%	80	120	0			
Toluene-d8	50.5	0	50	0	101.0%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203188-02A MS** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113187**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1055	50	500	1000	11.0%	47	145	0			S, MI
Acenaphthylene	1055	50	500	925	26.0%	33	145	0			S, MI
Anthracene	1775	50	500	2100	-65.0%	27	133	0			S, MI
Benz(a)anthracene	1865	50	500	2600	-147.0%	33	143	0			S, MI
Benzo(a)pyrene	2035	50	500	2980	-189.0%	17	163	0			S, MI
Benzo(b)fluoranthene	1425	50	500	1760	-67.0%	24	159	0			S, MI
Benzo(g,h,i)perylene	1715	50	500	2290	-115.0%	1	219	0			S, MI
Benzo(k)fluoranthene	1325	50	500	1700	-75.0%	11	162	0			S, MI
Chrysene	2355	50	500	3540	-237.0%	17	168	0			S, MI
Dibenz(a,h)anthracene	810	50	500	335	95.0%	1	227	0			
Fluoranthene	3800	50	500	5500	-340.0%	26	137	0			S, MI
Fluorene	1365	50	500	1360	1.0%	59	121	0			S, MI
Indeno(1,2,3-cd)pyrene	1380	50	500	1600	-44.0%	1	171	0			S, MI
Naphthalene	720	50	500	355	73.0%	21	133	0			
Phenanthrene	4350	50	500	6200	-370.0%	54	120	0			S, MI
Pyrene	4450	50	500	7100	-530.0%	52	115	0			S, MI
2-Fluorobiphenyl	660	0	500	0	132.0%	30	115	0			S, MI
4-Terphenyl-d14	640	0	500	0	128.0%	18	137	0			
Nitrobenzene-d5	570	0	500	0	114.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203212-01A MS** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/27/02** Prep Date: **3/25/02**

Client ID: **GP02-03 (3-5)** **0203212** Run ID: **ICP_020327A** SeqNo: **113405**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	26.1	1	50	1.07	50.1%	75	125	0			S,MI
Arsenic	44.8	1	50	3.12	83.4%	75	125	0			
Barium	114	1	50	71.4	85.2%	75	125	0			
Chromium	56.9	1	50	11.9	90.0%	75	125	0			
Cobalt	57	1	50	13	88.0%	75	125	0			
Copper	58.9	1	50	13.4	91.0%	75	125	0			
Iron	23500	4	500	23800	-60.0%	75	125	0			S,M
Lead	45.7	1	50	1.64	88.1%	75	125	0			
Magnesium	3500	10	500	3010	98.0%	75	125	0			
Manganese	311	1	50	253	116.0%	75	125	0			
Nickel	57.1	1	50	14.5	85.2%	75	125	0			
Selenium	41.5	1	50	0	83.0%	75	125	0			
Silver	43.7	1	50	0	87.4%	75	125	0			
Titanium	1480	1	50	1590	-220.0%	75	125	0			S,M
Vanadium	107	1	50	66	82.0%	75	125	0			
Zinc	85.4	1	50	43	84.8%	75	125	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID: **0203212-01A MSD** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/27/02** Prep Date: **3/25/02**

Client ID: **GP02-03 (3-5)** **0203212** Run ID: **ICP_020327A** SeqNo: **113406**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	27.8	1	50	1.07	53.5%	75	125	26.1	6.3%	20	S,MI
Arsenic	44.9	1	50	3.12	83.6%	75	125	44.8	0.2%	20	
Barium	106	1	50	71.4	69.2%	75	125	114	7.3%	20	S,MI
Chromium	57.1	1	50	11.9	90.4%	75	125	56.9	0.4%	20	
Cobalt	56.6	1	50	13	87.2%	75	125	57	0.7%	20	
Copper	59	1	50	13.4	91.2%	75	125	58.9	0.2%	20	
Iron	22500	4	500	23800	-260.0%	75	125	23500	4.3%	20	S,M
Lead	45.8	1	50	1.64	88.3%	75	125	45.7	0.2%	20	
Magnesium	3230	10	500	3010	44.0%	75	125	3500	8.0%	20	S,M
Manganese	272	1	50	253	38.0%	75	125	311	13.4%	20	S,M
Nickel	56.4	1	50	14.5	83.8%	75	125	57.1	1.2%	20	
Selenium	41.8	1	50	0	83.6%	75	125	41.5	0.7%	20	
Silver	44.1	1	50	0	88.2%	75	125	43.7	0.9%	20	
Titanium	1490	1	50	1590	-200.0%	75	125	1480	0.7%	20	S,M
Vanadium	109	1	50	66	86.0%	75	125	107	1.9%	20	
Zinc	84.2	1	50	43	82.4%	75	125	85.4	1.4%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203216-01A MS** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113784**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.475	0.005	0.5	0	95.0%	70	130	0			
Arsenic, 200.7 Diss	.469	0.006	0.5	0	93.8%	70	130	0			
Barium, 200.7 Diss	.544	0.005	0.5	0.06	96.8%	70	130	0			
Chromium, 200.7 Diss	.486	0.005	0.5	0	97.2%	70	130	0			
Cobalt, 200.7 Diss	.483	0.005	0.5	0	96.6%	70	130	0			
Copper, 200.7 Diss	.494	0.005	0.5	0	98.8%	70	130	0			
Iron, 200.7 Diss	24.9	0.01	5	19.8	102.0%	70	130	0			
Lead, 200.7 Diss	.479	0.005	0.5	0	95.8%	70	130	0			
Magnesium, 200.7 Diss	43.4	0.05	5	38.2	104.0%	70	130	0			
Manganese, 200.7 Diss	2.5	0.005	0.5	2.02	96.0%	70	130	0			
Nickel, 200.7 Diss	.48	0.005	0.5	0.0069	94.6%	70	130	0			
Selenium, 200.7 Diss	.481	0.005	0.5	0	96.2%	70	130	0			
Silver, 200.7 Diss	.488	0.005	0.5	0	97.6%	70	130	0			
Titanium, 200.7	.499	0.01	0.5	0	99.8%	70	130	0			
Vanadium, 200.7 Diss	.486	0.005	0.5	0	97.2%	70	130	0			
Zinc, 200.7 Diss	.507	0.005	0.5	0.0244	96.5%	70	130	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011849

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Sample Matrix Spike Duplicate

Sample ID: **0203216-01A MSD** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.473	0.005	0.5	0	94.6%	70	130	0.475	0.4%	20	
Arsenic, 200.7 Diss	.468	0.006	0.5	0	93.6%	70	130	0.469	0.2%	20	
Barium, 200.7 Diss	.543	0.005	0.5	0.06	96.6%	70	130	0.544	0.2%	20	
Chromium, 200.7 Diss	.485	0.005	0.5	0	97.0%	70	130	0.486	0.2%	20	
Cobalt, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.483	0.2%	20	
Copper, 200.7 Diss	.493	0.005	0.5	0	98.6%	70	130	0.494	0.2%	20	
Iron, 200.7 Diss	24.8	0.01	5	19.8	100.0%	70	130	24.9	0.4%	20	
Lead, 200.7 Diss	.475	0.005	0.5	0	95.0%	70	130	0.479	0.8%	20	
Magnesium, 200.7 Diss	43.4	0.05	5	38.2	104.0%	70	130	43.4	0.0%	20	
Manganese, 200.7 Diss	2.5	0.005	0.5	2.02	96.0%	70	130	2.5	0.0%	20	
Nickel, 200.7 Diss	.479	0.005	0.5	0.0069	94.4%	70	130	0.48	0.2%	20	
Selenium, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.481	0.2%	20	
Silver, 200.7 Diss	.487	0.005	0.5	0	97.4%	70	130	0.488	0.2%	20	
Titanium, 200.7	.499	0.01	0.5	0	99.8%	70	130	0.499	0.0%	20	
Vanadium, 200.7 Diss	.485	0.005	0.5	0	97.0%	70	130	0.486	0.2%	20	
Zinc, 200.7 Diss	.506	0.005	0.5	0.0244	96.3%	70	130	0.507	0.2%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203212** Run ID: **HIT MAN_020322B** SeqNo: **112917**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.199	0.04	0.2	0	99.5%	86	121	0			

Sample ID: **LCSD** Batch ID: **01 CN A-3/22/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/22/02** Prep Date: **3/22/02**
Client ID: **0203212** Run ID: **HIT MAN_020322B** SeqNo: **112930**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.203	0.04	0.2	0	101.5%	86	121	0.199	2.0%	20	

Sample ID: **LCS** Batch ID: **01 CN S-3/26/** Test Code: **EPA 9010B** Units: **mg/Kg** Analysis Date: **3/26/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **HIT MAN_020326A** SeqNo: **113194**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.205	0.04	0.2	0	102.5%	85	115	0			

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020401A** SeqNo: **114079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	15.5	1	20	0	77.5%	0	234	0			
Benzene	19.4	1	20	0	97.0%	37	151	0			
Chlorobenzene	18.9	1	20	0	94.5%	37	160	0			
Toluene	18.1	1	20	0	90.5%	47	150	0			
Trichloroethene	18.8	1	20	0	94.0%	71	157	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	50.1	0	50	0	100.2%	86	118	0			
Toluene-d8	51	0	50	0	102.0%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:

Client ID: **0203212** Run ID: **HORATIO_020330A** SeqNo: **114151**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	47.1	1	50	0	94.2%	0	234	0			
Benzene	53.6	1	50	0	107.2%	37	151	0			
Chlorobenzene	51	1	50	0	102.0%	37	160	0			
Toluene	50.7	1	50	0	101.4%	47	150	0			
Trichloroethene	51.2	1	50	0	102.4%	71	157	0			
4-Bromofluorobenzene	52	0	50	0	104.0%	86	115	0			
Dibromofluoromethane	50.5	0	50	0	101.0%	86	118	0			
Toluene-d8	50.8	0	50	0	101.6%	88	110	0			

Sample ID: **LCS** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:

Client ID: **0203212** Run ID: **ANGSTROM_020329A** SeqNo: **113947**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	25.5	5	25	0	102.0%	0	234	0			
Benzene	23.6	5	25	0	94.4%	37	151	0			
Chlorobenzene	20.4	5	25	0	81.6%	37	160	0			
Toluene	25.9	5	25	0	103.6%	47	150	0			
Trichloroethene	26.1	5	25	0	104.4%	71	157	0			
4-Bromofluorobenzene	48.7	0	50	0	97.4%	74	121	0			
Dibromofluoromethane	54.2	0	50	0	108.4%	80	120	0			
Toluene-d8	50.8	0	50	0	101.6%	81	117	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**

Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113177**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	515	50	500	0	103.0%	47	145	0			
Acenaphthylene	490	50	500	0	98.0%	33	145	0			
Anthracene	570	50	500	0	114.0%	27	133	0			
Benz(a)anthracene	390	50	500	0	78.0%	33	143	0			
Benzo(a)pyrene	320	50	500	0	64.0%	17	163	0			
Benzo(b)fluoranthene	350	50	500	0	70.0%	24	159	0			
Benzo(g,h,i)perylene	465	50	500	0	93.0%	1	219	0			
Benzo(k)fluoranthene	595	50	500	0	119.0%	11	162	0			
Chrysene	585	50	500	0	117.0%	17	168	0			
Dibenz(a,h)anthracene	395	50	500	0	79.0%	1	227	0			
Fluoranthene	545	50	500	0	109.0%	26	137	0			
Fluorene	515	50	500	0	103.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	430	50	500	0	86.0%	1	171	0			
Naphthalene	505	50	500	0	101.0%	21	133	0			
Phenanthrene	460	50	500	0	92.0%	54	120	0			
Pyrene	525	50	500	0	105.0%	52	115	0			
2-Fluorobiphenyl	575	0	500	0	115.0%	30	115	0			
4-Terphenyl-d14	660	0	500	0	132.0%	18	137	0			
Nitrobenzene-d5	470	0	500	0	94.0%	23	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4037** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/Kg** Analysis Date: **3/25/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113178**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	560	50	500	0	112.0%	47	145	515	8.4%	30	
Acenaphthylene	530	50	500	0	106.0%	33	145	490	7.8%	30	
Anthracene	615	50	500	0	123.0%	27	133	570	7.6%	30	
Benz(a)anthracene	425	50	500	0	85.0%	33	143	390	8.6%	30	
Benzo(a)pyrene	405	50	500	0	81.0%	17	163	320	23.4%	30	
Benzo(b)fluoranthene	400	50	500	0	80.0%	24	159	350	13.3%	30	
Benzo(g,h,i)perylene	495	50	500	0	99.0%	1	219	465	6.3%	30	
Benzo(k)fluoranthene	620	50	500	0	124.0%	11	162	595	4.1%	30	
Chrysene	625	50	500	0	125.0%	17	168	585	6.6%	30	
Dibenz(a,h)anthracene	465	50	500	0	93.0%	1	227	395	16.3%	30	
Fluoranthene	655	50	500	0	131.0%	26	137	545	18.3%	30	
Fluorene	550	50	500	0	110.0%	59	121	515	6.6%	30	
Indeno(1,2,3-cd)pyrene	450	50	500	0	90.0%	1	171	430	4.5%	30	
Naphthalene	555	50	500	0	111.0%	21	133	505	9.4%	30	
Phenanthrene	515	50	500	0	103.0%	54	120	460	11.3%	30	
Pyrene	510	50	500	0	102.0%	52	115	525	2.9%	30	
2-Fluorobiphenyl	565	0	500	0	113.0%	30	115	0	0.0%	30	
4-Terphenyl-d14	545	0	500	0	109.0%	18	137	0	0.0%	30	
Nitrobenzene-d5	490	0	500	0	98.0%	23	120	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4038** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/Kg** Analysis Date: **3/27/02** Prep Date: **3/25/02**

Client ID: **0203212** Run ID: **ICP_020327A** SeqNo: **113403**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	47.1	1	50	0	94.2%	80	120	0			
Arsenic	46.7	1	50	0	93.4%	80	120	0			
Barium	48.4	1	50	0	96.8%	80	120	0			
Chromium	50.3	1	50	0	100.6%	80	120	0			
Cobalt	49.5	1	50	0	99.0%	80	120	0			
Copper	49.7	1	50	0	99.4%	80	120	0			
Iron	516	2	500	0	103.2%	80	120	0			
Lead	49.3	1	50	0	98.6%	80	120	0			
Magnesium	491	10	500	0	98.2%	80	120	0			
Manganese	49.5	1	50	0	99.0%	80	120	0			
Nickel	48.8	1	50	0	97.6%	80	120	0			
Selenium	46.5	1	50	0	93.0%	80	120	0			
Silver	47.7	1	50	0	95.4%	80	120	0			
Titanium	51.2	1	50	0	102.4%	80	120	0			
Vanadium	49.4	1	50	0	98.8%	80	120	0			
Zinc	49	1	50	0	98.0%	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4045** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**

Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113782**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.468	0.005	0.5	0	93.6%	85	115	0			
Arsenic, 200.7	.468	0.006	0.5	0	93.6%	85	115	0			
Barium, 200.7	.481	0.005	0.5	0	96.2%	85	115	0			
Chromium, 200.7	.489	0.005	0.5	0	97.8%	85	115	0			
Cobalt, 200.7	.488	0.005	0.5	0	97.6%	85	115	0			
Copper, 200.7	.488	0.005	0.5	0	97.6%	85	115	0			
Iron, 200.7	5.08	0.01	5	0	101.6%	85	115	0			
Lead, 200.7	.484	0.005	0.5	0	96.8%	85	115	0			
Magnesium, 200.7	4.81	0.05	5	0	96.2%	85	115	0			
Manganese, 200.7	.487	0.005	0.5	0	97.4%	85	115	0			
Nickel, 200.7	.484	0.005	0.5	0	96.8%	85	115	0			
Selenium, 200.7	.474	0.005	0.5	0	94.8%	85	115	0			
Silver, 200.7	.477	0.005	0.5	0	95.4%	85	115	0			
Titanium, 200.7	.5	0.01	0.5	0	100.0%	85	115	0			
Vanadium, 200.7	.485	0.005	0.5	0	97.0%	85	115	0			
Zinc, 200.7	.486	0.005	0.5	0	97.2%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**

Client ID: **0203212** Run ID: **MANFREDD_020327A** SeqNo: **113502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.5	0.1	1	0	50.0%	47	145	0			
Acenaphthylene	.51	0.1	1	0	51.0%	33	145	0			
Anthracene	.55	0.1	1	0	55.0%	27	133	0			
Benz(a)anthracene	.53	0.1	1	0	53.0%	33	143	0			
Benzo(a)pyrene	.5	0.1	1	0	50.0%	17	163	0			
Benzo(b)fluoranthene	.46	0.1	1	0	46.0%	24	159	0			
Benzo(g,h,i)perylene	.48	0.1	1	0	48.0%	1	219	0			
Benzo(k)fluoranthene	.56	0.1	1	0	56.0%	11	162	0			
Chrysene	.63	0.1	1	0	63.0%	17	168	0			
Dibenz(a,h)anthracene	.52	0.1	1	0	52.0%	1	227	0			
Fluoranthene	.62	0.1	1	0	62.0%	26	137	0			
Fluorene	.59	0.1	1	0	59.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	.48	0.1	1	0	48.0%	1	171	0			
Naphthalene	.48	0.1	1	0	48.0%	21	133	0			
Phenanthrene	.54	0.1	1	0	54.0%	54	120	0			
Pyrene	.54	0.1	1	0	54.0%	52	115	0			
2-Fluorobiphenyl	.57	0	1	0	57.0%	43	116	0			
4-Terphenyl-d14	.72	0	1	0	72.0%	33	141	0			
Nitrobenzene-d5	.5	0	1	0	50.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **MANFREDD_020327A** SeqNo: **113503**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.57	0.1	1	0	57.0%	47	145	0.5	13.1%	30	
Acenaphthylene	.59	0.1	1	0	59.0%	33	145	0.51	14.5%	30	
Anthracene	.59	0.1	1	0	59.0%	27	133	0.55	7.0%	30	
Benz(a)anthracene	.55	0.1	1	0	55.0%	33	143	0.53	3.7%	30	
Benzo(a)pyrene	.54	0.1	1	0	54.0%	17	163	0.5	7.7%	30	
Benzo(b)fluoranthene	.51	0.1	1	0	51.0%	24	159	0.46	10.3%	30	
Benzo(g,h,i)perylene	.51	0.1	1	0	51.0%	1	219	0.48	6.1%	30	
Benzo(k)fluoranthene	.6	0.1	1	0	60.0%	11	162	0.56	6.9%	30	
Chrysene	.7	0.1	1	0	70.0%	17	168	0.63	10.5%	30	
Dibenz(a,h)anthracene	.51	0.1	1	0	51.0%	1	227	0.52	1.9%	30	
Fluoranthene	.65	0.1	1	0	65.0%	26	137	0.62	4.7%	30	
Fluorene	.61	0.1	1	0	61.0%	59	121	0.59	3.3%	30	
Indeno(1,2,3-cd)pyrene	.49	0.1	1	0	49.0%	1	171	0.48	2.1%	30	
Naphthalene	.57	0.1	1	0	57.0%	21	133	0.48	17.1%	30	
Phenanthrene	.56	0.1	1	0	56.0%	54	120	0.54	3.6%	30	
Pyrene	.61	0.1	1	0	61.0%	52	115	0.54	12.2%	30	
2-Fluorobiphenyl	.65	0	1	0	65.0%	43	116	0	0.0%	30	
4-Terphenyl-d14	.77	0	1	0	77.0%	33	141	0	0.0%	30	
Nitrobenzene-d5	.65	0	1	0	65.0%	35	114	0	0.0%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020401A** SeqNo: **114078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49.8	1	50	0	99.6%	80	120	0			
1,2-Dichloropropane	54.5	1	50	0	109.0%	80	120	0			
Chloroform	54.3	1	50	0	108.6%	80	120	0			
Ethylbenzene	51.3	1	50	0	102.6%	80	120	0			
Toluene	53.2	1	50	0	106.4%	80	120	0			
Vinyl chloride	49.4	1.2	50	0	98.8%	80	120	0			
4-Bromofluorobenzene	50.3	0	50	0	100.6%	86	115	0			
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0			
Toluene-d8	52.3	0	50	0	104.6%	88	110	0			

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203212** Run ID: **HORATIO_020330A** SeqNo: **114150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	19.88	1	20	0	99.4%	80	120	0			
1,2-Dichloropropane	20.8	1	20	0	104.0%	80	120	0			
Chloroform	20.3	1	20	0	101.5%	80	120	0			
Ethylbenzene	20.85	1	20	0	104.3%	80	120	0			
Toluene	20	1	20	0	100.0%	80	120	0			
Vinyl chloride	21.75	1.2	20	0	108.8%	80	120	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	49.2	0	50	0	98.4%	86	118	0			
Toluene-d8	50.5	0	50	0	101.0%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011859

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 S-4/1** Test Code: **EPA 8260B** Units: **µg/Kg** Analysis Date: **3/29/02** Prep Date:

Client ID: **0203212** Run ID: **ANGSTROM_020329A** SeqNo: **113946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	106	5	100	0	106.0%	80	120	0			
1,2-Dichloropropane	104	5	100	0	104.0%	80	120	0			
Chloroform	99.7	5	100	0	99.7%	80	120	0			
Ethylbenzene	105	5	100	0	105.0%	80	120	0			
Toluene	102	5	100	0	102.0%	80	120	0			
Vinyl chloride	108	10	100	0	108.0%	80	120	0			
4-Bromofluorobenzene	49.7	0	50	0	99.4%	86	115	0			
Dibromofluoromethane	46.8	0	50	0	93.6%	86	118	0			
Toluene-d8	48.7	0	50	0	97.4%	88	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4037** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/25/02** Prep Date:
Client ID: **0203212** Run ID: **MANFREDD_020325B** SeqNo: **113176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.97	0.1	1	0	97.0%	80	120	0			
Acenaphthylene	.96	0.1	1	0	96.0%	80	120	0			
Anthracene	1.08	0.1	1	0	108.0%	80	120	0			
Benz(a)anthracene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(a)pyrene	.83	0.1	1	0	83.0%	80	120	0			
Benzo(b)fluoranthene	.8	0.1	1	0	80.0%	80	120	0			
Benzo(g,h,i)perylene	.9	0.1	1	0	90.0%	80	120	0			
Benzo(k)fluoranthene	.97	0.1	1	0	97.0%	80	120	0			
Chrysene	1.09	0.1	1	0	109.0%	80	120	0			
Dibenz(a,h)anthracene	.85	0.1	1	0	85.0%	80	120	0			
Fluoranthene	1.1	0.1	1	0	110.0%	80	120	0			
Fluorene	1.02	0.1	1	0	102.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.84	0.1	1	0	84.0%	80	120	0			
Naphthalene	1.2	0.1	1	0	120.0%	80	120	0			
Phenanthrene	.97	0.1	1	0	97.0%	80	120	0			
Pyrene	.95	0.1	1	0	95.0%	80	120	0			
2-Fluorobiphenyl	.97	0	1	0	97.0%	30	115	0			
4-Terphenyl-d14	.85	0	1	0	85.0%	18	137	0			
Nitrobenzene-d5	1.03	0	1	0	103.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:

Client ID: **0203212** Run ID: **MANFREDD_020327A** SeqNo: **113501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.1	1	0	110.0%	80	120	0			
Acenaphthylene	1.16	0.1	1	0	116.0%	80	120	0			
Anthracene	1.16	0.1	1	0	116.0%	80	120	0			
Benz(a)anthracene	1.04	0.1	1	0	104.0%	80	120	0			
Benzo(a)pyrene	1.02	0.1	1	0	102.0%	80	120	0			
Benzo(b)fluoranthene	.98	0.1	1	0	98.0%	80	120	0			
Benzo(g,h,i)perylene	.94	0.1	1	0	94.0%	80	120	0			
Benzo(k)fluoranthene	1.11	0.1	1	0	111.0%	80	120	0			
Chrysene	1.11	0.1	1	0	111.0%	80	120	0			
Dibenz(a,h)anthracene	1	0.1	1	0	100.0%	80	120	0			
Fluoranthene	1.2	0.1	1	0	120.0%	80	120	0			
Fluorene	1.02	0.1	1	0	102.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.92	0.1	1	0	92.0%	80	120	0			
Naphthalene	1.11	0.1	1	0	111.0%	80	120	0			
Phenanthrene	1.05	0.1	1	0	105.0%	80	120	0			
Pyrene	1.07	0.1	1	0	107.0%	80	120	0			
2-Fluorobiphenyl	1.12	0	1	0	112.0%	43	116	0			
4-Terphenyl-d14	1.15	0	1	0	115.0%	33	141	0			
Nitrobenzene-d5	1.12	0	1	0	112.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/27/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **ICP_020327A** SeqNo: **113401**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	25.8	0.01	25	0	103.2%	90	110	0			
Magnesium	25.4	0.05	25	0	101.6%	90	110	0			
Titanium	5.07	0.01	5	0	101.4%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4038** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/27/02** Prep Date: **3/25/02**
Client ID: **0203212** Run ID: **ICP_020327A** SeqNo: **113400**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	.493	0.005	0.5	0	98.6%	90	110	0			
Arsenic	.501	0.005	0.5	0	100.2%	90	110	0			
Barium	.501	0.005	0.5	0	100.2%	90	110	0			
Chromium	.498	0.005	0.5	0	99.6%	90	110	0			
Cobalt	.498	0.005	0.5	0	99.6%	90	110	0			
Copper	.498	0.005	0.5	0	99.6%	90	110	0			
Iron	.5	0.01	0.5	0	100.0%	90	110	0			
Lead	.501	0.005	0.5	0	100.2%	90	110	0			
Manganese	.497	0.005	0.5	0	99.4%	90	110	0			
Nickel	.498	0.005	0.5	0	99.6%	90	110	0			
Selenium	.504	0.005	0.5	0	100.8%	90	110	0			
Silver	.497	0.005	0.5	0	99.4%	90	110	0			
Vanadium	.498	0.005	0.5	0	99.6%	90	110	0			
Zinc	.502	0.005	0.5	0	100.4%	90	110	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011863

CLIENT: Limno-Tech, Inc.
Work Order: 0203212
Project:

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4045** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	25.6	0.01	25	0	102.4%	90	110	0			
Magnesium	24.9	0.05	25	0	99.6%	90	110	0			
Titanium	5.05	0.01	5	0	101.0%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203212** Run ID: **ICP_020328B** SeqNo: **113779**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.491	0.005	0.5	0	98.2%	95	105	0			
Arsenic, 200.7	.495	0.006	0.5	0	99.0%	95	105	0			
Barium, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			
Chromium, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Cobalt, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Copper, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Iron, 200.7	.494	0.01	0.5	0	98.8%	95	105	0			
Lead, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			
Manganese, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Nickel, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			
Selenium, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Silver, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Vanadium, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			
Zinc, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

ENVIRONMENTAL SERVICES LABORATORY – GLOSSARY OF FLAGS

QUALIFIER	DESCRIPTION
AA	This sample was analyzed after the holding time had expired.
AB	The hydrocarbon pattern in this sample is not typical of gasoline.
AC	The hydrocarbon pattern in this sample is not typical of diesel.
AD	The hydrocarbon pattern in this sample is not typical of oil.
AE	The hydrocarbon pattern in this sample extends into the gasoline range.
AF	The hydrocarbon pattern in this sample extends into the diesel range.
AG	The hydrocarbon pattern in this sample extends into the oil range.
A	This analysis was performed on a VOA sample containing headspace.
B	Analyte detected in the Method Blank above the reporting level.
C	The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
D	The sample was supplied in an inappropriate container according to method criteria.
E	This value is above the quantitation limit. It is considered an estimate.
H	The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
J	The result is above the Method Detection Limit (MDL) and below the Reporting level (RL). It is considered an estimate.
M	The MS/MSD recoveries are not calculable due to a high amount of analyte in sample.
MI	This indicates a high level of matrix interference affecting the spike or surrogate recovery.
N	See case narrative.
O	Detection Limits are elevated due to sample dilution. See case narrative.
Q	Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
R	The RPD result is outside method control limits. See other qualifiers or case narrative.
S	The spike recovery is outside method control limits. See other qualifiers or case narrative.
T	The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
X	Unable to quantitate surrogate recovery due to sample dilution.

Environmental Services Laboratory, Inc

CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

Company: Limno-Tech, Inc
Project Manager: Kathi Futornick
LABORATORY # 0203212
Address: 4640 SW Macadam Ave Suite 60 Portland, OR
Phone: 503-248-1768 Fax: 503-248-1959

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles (8260B)	8270 GCMS Semivolatiles	8081 GC Pesticides/PCBs	8081m PCBs only	RCRA Metals (8)	Priority Pollutant Metals (13)	Metals:	TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	Total Cyl (9010)	# OF CONTAINERS
F GP02-03 (3'-5')	3/21/02	13:30	S	01					X			✓	✓					✓				✓	3
F GP02-03 (24'-26')	3/21/02	13:50	S	02					X			✓	✓					✓				✓	3
F GP02-03 (22'-24')	3/21/02	13:48	S	03					X			✓	✓					✓				✓	3
F GP02-02 (56'-60')	3/21/02	09:00	W	04					X			3	1					1				1	6
F GP02-02 (96'-100')	3/21/02	10:30	W	05					X			3	1					1				1	6
X Field Blank	3/21/02	09:30	W	06					X			3	1					1				1	6
Trip Blank	—	—	W	07					X			1											1
F GP02-03 (31'-35')	3/21/02	19:15	W	08					X			3	1					1				1	6

(LOW DETECTION LIMITS NEEDED ESPECIALLY FOR CHLORINATEDS)

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER:	TOTAL NUMBER OF CONTAINERS
PROJECT NAME:	COC SEALS INTACT? Y / N / NA
PURCHASE ORDER NUMBER:	RECEIVED INTACT? Y / N
ONGOING PROJECT? YES ☐ NO ☐	RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS: VOC's 8260 B ; PAHs 8270 SIM
T. Cyl 9010;
Metals: Sb, As, Ba, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Ti, Va, Zn (6010/700, 2007)

Sampled by: Joyce S Dunkin
Received via:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Joyce S Dunkin Time 16:06	SIGNATURE: Time	SIGNATURE: Time
Printed Name: Joyce S Dunkin Date 3/21/02	Printed Name: Date	Printed Name: Date
Company: Limno-Tech	Company:	Company:
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Leslie Rush Time 5:00pm	Signature: Time	Signature: Time
Printed Name: Leslie Rush Date 3-21-02	Printed Name: Date	Printed Name: Date
Company: ESL	Company:	ESL Inc.:

DISTRIBUTION: White, Canary - ESL, Pink - Originator

SCOEPA00011866

Environmental Services Laboratory, Inc.

E S L

17400 SW Upper Boones Ferry Road, Suite 270 • Portland, OR 97224 • (503) 670-8520

April 05, 2002

Kathi Futernick
Limno-Tech, Inc.
4640 SW Macadam Ave
Ste 60
Portland, OR 97201
TEL: (503) 248-1768
FAX (503) 248-1959

RE: PDX WAC/Walker Slitronics Order No.: 0203216

Dear Kathi Futernick,

Environmental Services Laboratory received 4 samples on 3/22/02 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
- Cyanide (EPA 9010B)
- ICP Metals (EPA 200.7)
- PAH BY SIM, Aqueous (8270-SIM)
- Volatiles by GC/MS (EPA 8260B)

Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval of the Laboratory.
The following checked data sections are included in this report, and numbered to indicate total pages within each report section.

✓Base Sample Report ✓Method Blank Report ✓Sample Duplicate Report
✓Matrix Spike Report ✓Laboratory Control Spike ✓Continuing Calibration Verification Report ✓Initial Calibration Verification Report
If you have any questions regarding these test results, please feel free to call.

Sincerely,

Leslie Rush
Project Manager

Keith Hunter
Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-01A

Client Sample ID: GP03-03(56-60)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **csc**
Cyanide	0.498	0.0400		mg/L	1	3/26/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7 Diss	ND	0.00600		mg/L	1	3/28/02
Barium, 200.7 Diss	0.0600	0.00500		mg/L	1	3/28/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7 Diss	19.8	0.0100		mg/L	1	3/28/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7 Diss	38.2	0.0500		mg/L	1	3/28/02
Manganese, 200.7 Diss	2.02	0.00500		mg/L	1	3/28/02
Nickel, 200.7 Diss	0.00690	0.00500		mg/L	1	3/28/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7 Diss	0.0244	0.00500		mg/L	1	3/28/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-01A

Client Sample ID: GP03-03(56-60)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	2.94	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

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* - Value exceeds Maximum Contaminant Level
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R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-01A

Client Sample ID: GP03-03(56-60)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	101	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	33.4	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	204	12.0		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	113.2	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	104.8	86-118		%REC	1	3/30/02
Surr: Toluene-d8	101.4	88-110		%REC	1	3/30/02

Qualifiers:

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R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-01A

Client Sample ID: GP03-03(56-60)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	0.620	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	0.150	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	0.160	0.100		µg/L	1	3/27/02
Phenanthrene	ND	0.100		µg/L	1	3/27/02
Pyrene	0.190	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	67.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	85.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	54.0	35-114		%REC	1	3/27/02

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Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-02A

Client Sample ID: GP03-03(96-100)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**EPA 9010B**				Analyst: **csc**
Cyanide	0.309	0.0400		mg/L	1	3/26/02
ICP METALS		**EPA 200.7**				Analyst: **mal**
Antimony, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Arsenic, 200.7 Diss	ND	0.00600		mg/L	1	3/28/02
Barium, 200.7 Diss	0.0871	0.00500		mg/L	1	3/28/02
Chromium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Cobalt, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Copper, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Iron, 200.7 Diss	47.2	0.0100		mg/L	1	3/28/02
Lead, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Magnesium, 200.7 Diss	35.3	0.0500		mg/L	1	3/28/02
Manganese, 200.7 Diss	3.11	0.00500		mg/L	1	3/28/02
Nickel, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Selenium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Silver, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Titanium, 200.7	ND	0.0100		mg/L	1	3/28/02
Vanadium, 200.7 Diss	ND	0.00500		mg/L	1	3/28/02
Zinc, 200.7 Diss	0.0188	0.00500		mg/L	1	3/28/02

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Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-02A

Client Sample ID: GP03-03(96-100)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

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Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-02A

Client Sample ID: GP03-03(96-100)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	ND	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	113.0	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	106.0	86-118		%REC	1	3/30/02
Surr: Toluene-d8	102.0	88-110		%REC	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
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Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-02A

Client Sample ID: GP03-03(96-100)
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	0.210	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	0.220	0.100		µg/L	1	3/27/02
Phenanthrene	0.10	0.100		µg/L	1	3/27/02
Pyrene	0.310	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	68.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	89.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	44.0	35-114		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-03A

Client Sample ID: Screen Blank
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-03A

Client Sample ID: Screen Blank
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	ND	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	110.2	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	108.4	86-118		%REC	1	3/30/02
Surr: Toluene-d8	105.0	88-110		%REC	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-03A

Client Sample ID: Screen Blank
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, AQUEOUS		**8270-SIM**				Analyst: **mrs**
Acenaphthene	ND	0.100		µg/L	1	3/27/02
Acenaphthylene	ND	0.100		µg/L	1	3/27/02
Anthracene	ND	0.100		µg/L	1	3/27/02
Benz(a)anthracene	ND	0.100		µg/L	1	3/27/02
Benzo(a)pyrene	ND	0.100		µg/L	1	3/27/02
Benzo(b)fluoranthene	ND	0.100		µg/L	1	3/27/02
Benzo(g,h,i)perylene	ND	0.100		µg/L	1	3/27/02
Benzo(k)fluoranthene	ND	0.100		µg/L	1	3/27/02
Chrysene	ND	0.100		µg/L	1	3/27/02
Dibenz(a,h)anthracene	ND	0.100		µg/L	1	3/27/02
Fluoranthene	ND	0.100		µg/L	1	3/27/02
Fluorene	ND	0.100		µg/L	1	3/27/02
Indeno(1,2,3-cd)pyrene	ND	0.100		µg/L	1	3/27/02
Naphthalene	ND	0.100		µg/L	1	3/27/02
Phenanthrene	ND	0.100		µg/L	1	3/27/02
Pyrene	ND	0.100		µg/L	1	3/27/02
Surr: 2-Fluorobiphenyl	62.0	43-116		%REC	1	3/27/02
Surr: 4-Terphenyl-d14	82.0	33-141		%REC	1	3/27/02
Surr: Nitrobenzene-d5	45.0	35-114		%REC	1	3/27/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-04A

Client Sample ID: Tripblank
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**EPA 8260B**				Analyst: **keh**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,1-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	3/30/02
1,1,2-Trichloroethane	ND	1.00		µg/L	1	3/30/02
1,1-Dichloroethane	ND	1.50		µg/L	1	3/30/02
1,1-Dichloroethene	ND	1.00		µg/L	1	3/30/02
1,1-Dichloropropene	ND	1.00		µg/L	1	3/30/02
1,2,3-Trichlorobenzene	ND	1.80		µg/L	1	3/30/02
1,2,3-Trichloropropane	ND	1.00		µg/L	1	3/30/02
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dibromo-3-chloropropane	ND	2.00		µg/L	1	3/30/02
1,2-Dibromoethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,2-Dichloroethane	ND	1.00		µg/L	1	3/30/02
1,2-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
1,3-Dichloropropane	ND	1.00		µg/L	1	3/30/02
1,4-Dichlorobenzene	ND	1.00		µg/L	1	3/30/02
2,2-Dichloropropane	ND	1.90		µg/L	1	3/30/02
2-Butanone	ND	20.0		µg/L	1	3/30/02
2-Chloroethyl vinyl ether	ND	5.00		µg/L	1	3/30/02
2-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
2-Hexanone	ND	20.0		µg/L	1	3/30/02
4-Chlorotoluene	ND	1.00		µg/L	1	3/30/02
4-Isopropyltoluene	ND	1.00		µg/L	1	3/30/02
4-Methyl-2-pentanone	ND	1.00		µg/L	1	3/30/02
Acetone	ND	20.0		µg/L	1	3/30/02
Benzene	ND	1.00		µg/L	1	3/30/02
Bromobenzene	ND	1.00		µg/L	1	3/30/02
Bromochloromethane	ND	1.00		µg/L	1	3/30/02
Bromodichloromethane	ND	1.00		µg/L	1	3/30/02
Bromoform	ND	1.00		µg/L	1	3/30/02
Bromomethane	ND	5.00		µg/L	1	3/30/02
Carbon disulfide	ND	1.00		µg/L	1	3/30/02
Carbon tetrachloride	ND	1.00		µg/L	1	3/30/02
Chlorobenzene	ND	1.00		µg/L	1	3/30/02
Chloroethane	ND	5.00		µg/L	1	3/30/02
Chloroform	ND	1.00		µg/L	1	3/30/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Lab Order: 0203216
Project: PDX WAC/Walker Slitronics
Lab ID: 0203216-04A

Client Sample ID: Tripblank
Tag Number:
Collection Date: 3/22/02
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Chloromethane	ND	2.00		µg/L	1	3/30/02
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Dibromochloromethane	ND	1.00		µg/L	1	3/30/02
Dibromomethane	ND	1.00		µg/L	1	3/30/02
Dichlorodifluoromethane	ND	2.00		µg/L	1	3/30/02
Ethylbenzene	ND	1.00		µg/L	1	3/30/02
Hexachlorobutadiene	ND	2.00		µg/L	1	3/30/02
Iodomethane	ND	5.00		µg/L	1	3/30/02
Isopropylbenzene	ND	1.00		µg/L	1	3/30/02
m,p-Xylene	ND	2.00		µg/L	1	3/30/02
Methyl tert-butyl ether	ND	2.00		µg/L	1	3/30/02
Methylene chloride	ND	20.0		µg/L	1	3/30/02
n-Butylbenzene	ND	1.00		µg/L	1	3/30/02
n-Propylbenzene	ND	1.00		µg/L	1	3/30/02
Naphthalene	ND	2.00		µg/L	1	3/30/02
o-Xylene	ND	1.00		µg/L	1	3/30/02
sec-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Styrene	ND	1.00		µg/L	1	3/30/02
tert-Butylbenzene	ND	1.00		µg/L	1	3/30/02
Tetrachloroethene	ND	1.00		µg/L	1	3/30/02
Toluene	ND	1.00		µg/L	1	3/30/02
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	3/30/02
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	3/30/02
Trichloroethene	ND	1.00		µg/L	1	3/30/02
Trichlorofluoromethane	ND	2.00		µg/L	1	3/30/02
Vinyl acetate	ND	1.00		µg/L	1	3/30/02
Vinyl chloride	ND	1.20		µg/L	1	3/30/02
Surr: 4-Bromofluorobenzene	106.8	86-115		%REC	1	3/30/02
Surr: Dibromofluoromethane	103.4	86-118		%REC	1	3/30/02
Surr: Toluene-d8	103.2	88-110		%REC	1	3/30/02

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

SCOEPA00011880

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **01 CN A-3/27/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **HIT MAN_020327B** SeqNo: **113229**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	ND	0.04									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020401A** SeqNo: **114077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Method Blank

trans-1,2-Dichloroethene	ND	1						
trans-1,3-Dichloropropene	ND	1						
Trichloroethene	ND	1						
Trichlorofluoromethane	ND	2						
Vinyl acetate	ND	1						
Vinyl chloride	ND	1.2						
4-Bromofluorobenzene	55.8	0	50	0	111.6%	86	115	0
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0
Toluene-d8	51.4	0	50	0	102.8%	88	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

Sample ID: **MBlank** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020330A** SeqNo: **114149**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1									
1,1,1-Trichloroethane	ND	1									
1,1,2,2-Tetrachloroethane	ND	1									
1,1,2-Trichloroethane	ND	1									
1,1-Dichloroethane	ND	1.5									
1,1-Dichloroethene	ND	1									
1,1-Dichloropropene	ND	1									
1,2,3-Trichlorobenzene	ND	1.8									
1,2,3-Trichloropropane	ND	1									
1,2,4-Trichlorobenzene	ND	1									
1,2,4-Trimethylbenzene	ND	1									
1,2-Dibromo-3-chloropropane	ND	2									
1,2-Dibromoethane	ND	1									
1,2-Dichlorobenzene	ND	1									
1,2-Dichloroethane	ND	1									
1,2-Dichloropropane	ND	1									
1,3,5-Trimethylbenzene	ND	1									
1,3-Dichlorobenzene	ND	1									
1,3-Dichloropropane	ND	1									
1,4-Dichlorobenzene	ND	1									
2,2-Dichloropropane	ND	1.9									
2-Butanone	ND	20									
2-Chloroethyl vinyl ether	ND	5									
2-Chlorotoluene	ND	1									
2-Hexanone	ND	20									
4-Chlorotoluene	ND	1									
4-Isopropyltoluene	ND	1									
4-Methyl-2-pentanone	ND	1									
Acetone	ND	20									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

Benzene	ND	1
Bromobenzene	ND	1
Bromochloromethane	ND	1
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	5
Carbon disulfide	ND	1
Carbon tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroethane	ND	5
Chloroform	ND	1
Chloromethane	ND	2
cis-1,2-Dichloroethene	ND	1
cis-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Dibromomethane	ND	1
Dichlorodifluoromethane	ND	2
Ethylbenzene	ND	1
Hexachlorobutadiene	ND	2
Iodomethane	ND	5
Isopropylbenzene	ND	1
m,p-Xylene	ND	2
Methyl tert-butyl ether	ND	2
Methylene chloride	ND	20
n-Butylbenzene	ND	1
n-Propylbenzene	ND	1
Naphthalene	ND	2
o-Xylene	ND	1
sec-Butylbenzene	ND	1
Styrene	ND	1
tert-Butylbenzene	ND	1
Tetrachloroethene	ND	1
Toluene	ND	1

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Method Blank

trans-1,2-Dichloroethene	ND	1									
trans-1,3-Dichloropropene	ND	1									
Trichloroethene	ND	1									
Trichlorofluoromethane	ND	2									
Vinyl acetate	ND	1									
Vinyl chloride	ND	1.2									
4-Bromofluorobenzene	51.1	0	50	0	102.2%	86	115	0			
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0			
Toluene-d8	49.7	0	50	0	99.4%	88	110	0			

Sample ID: **MB-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **MANFREDD_020327A** SeqNo: **113500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.1									
Acenaphthylene	ND	0.1									
Anthracene	ND	0.1									
Benz(a)anthracene	ND	0.1									
Benzo(a)pyrene	ND	0.1									
Benzo(b)fluoranthene	ND	0.1									
Benzo(g,h,i)perylene	ND	0.1									
Benzo(k)fluoranthene	ND	0.1									
Chrysene	ND	0.1									
Dibenz(a,h)anthracene	ND	0.1									
Fluoranthene	ND	0.1									
Fluorene	ND	0.1									
Indeno(1,2,3-cd)pyrene	ND	0.1									
Naphthalene	ND	0.1									
Phenanthrene	ND	0.1									
Pyrene	ND	0.1									
2-Fluorobiphenyl	.61	0	1	0	61.0%	43	116	0			
4-Terphenyl-d14	.81	0	1	0	81.0%	33	141	0			
Nitrobenzene-d5	.55	0	1	0	55.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Duplicate

Sample ID: **0203200-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:

Client ID: **0203216** Run ID: **HORATIO_020330A** SeqNo: **114153**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Duplicate

4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20
Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	0	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

SCOEPA00011889

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Duplicate

Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	52.6	0	50	0	105.2%	86	115	0	0.0%	0
Dibromofluoromethane	51.8	0	50	0	103.6%	86	118	0	0.0%	0
Toluene-d8	49.5	0	50	0	99.0%	88	110	0	0.0%	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Sample Duplicate

Sample ID: **0203221-08A DUP** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020401A** SeqNo: **114085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,1-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2,2-Tetrachloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1,2-Trichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethane	ND	1.5	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,1-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichlorobenzene	ND	1.8	0	0	0.0%	0	0	0	0.0%	20	
1,2,3-Trichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2,4-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromo-3-chloropropane	ND	2	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dibromoethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloroethane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,2-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3,5-Trimethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,3-Dichloropropane	ND	1	0	0	0.0%	0	0	0	0.0%	20	
1,4-Dichlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2,2-Dichloropropane	ND	1.9	0	0	0.0%	0	0	0	0.0%	20	
2-Butanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
2-Chloroethyl vinyl ether	ND	5	0	0	0.0%	0	0	0	0.0%	20	
2-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
2-Hexanone	ND	20	0	0	0.0%	0	0	0	0.0%	20	
4-Chlorotoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Isopropyltoluene	ND	1	0	0	0.0%	0	0	0	0.0%	20	
4-Methyl-2-pentanone	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Acetone	ND	20	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Duplicate

Benzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromodichloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromoform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Bromomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Carbon disulfide	ND	1	0	0	0.0%	0	0	0	0.0%	20
Carbon tetrachloride	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chlorobenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloroethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Chloroform	ND	1	0	0	0.0%	0	0	0	0.0%	20
Chloromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
cis-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
cis-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromochloromethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dibromomethane	ND	1	0	0	0.0%	0	0	0	0.0%	20
Dichlorodifluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Ethylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Hexachlorobutadiene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Iodomethane	ND	5	0	0	0.0%	0	0	0	0.0%	20
Isopropylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
m,p-Xylene	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methyl tert-butyl ether	ND	2	0	0	0.0%	0	0	0	0.0%	20
Methylene chloride	ND	20	0	0	0.0%	0	0	22.7	0.0%	20
n-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
n-Propylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Naphthalene	ND	2	0	0	0.0%	0	0	0	0.0%	20
o-Xylene	ND	1	0	0	0.0%	0	0	0	0.0%	20
sec-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Styrene	ND	1	0	0	0.0%	0	0	0	0.0%	20
tert-Butylbenzene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Tetrachloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Toluene	ND	1	0	0	0.0%	0	0	0	0.0%	20

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Duplicate

trans-1,2-Dichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
trans-1,3-Dichloropropene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichloroethene	ND	1	0	0	0.0%	0	0	0	0.0%	20
Trichlorofluoromethane	ND	2	0	0	0.0%	0	0	0	0.0%	20
Vinyl acetate	ND	1	0	0	0.0%	0	0	0	0.0%	20
Vinyl chloride	ND	1.2	0	0	0.0%	0	0	0	0.0%	20
4-Bromofluorobenzene	54.4	0	50	0	108.8%	86	115	0	0.0%	0
Dibromofluoromethane	51.1	0	50	0	102.2%	86	118	0	0.0%	0
Toluene-d8	51.3	0	50	0	102.6%	88	110	0	0.0%	0

Sample ID: **0203216-02A DUP** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**

Client ID: **GP03-03(96-100)** **0203216** Run ID: **ICP_020328B** SeqNo: **113787**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Arsenic, 200.7 Diss	ND	0.006	0	0	0.0%	0	0	0	0.0%	20	
Barium, 200.7 Diss	.0878	0.005	0	0	0.0%	0	0	0.0871	0.8%	20	
Chromium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Cobalt, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Copper, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Iron, 200.7 Diss	47.8	0.01	0	0	0.0%	0	0	47.2	1.3%	20	
Lead, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Magnesium, 200.7 Diss	35.7	0.05	0	0	0.0%	0	0	35.3	1.1%	20	
Manganese, 200.7 Diss	3.15	0.005	0	0	0.0%	0	0	3.11	1.3%	20	
Nickel, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Selenium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Silver, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Titanium, 200.7	ND	0.01	0	0	0.0%	0	0	0	0.0%	20	
Vanadium, 200.7 Diss	ND	0.005	0	0	0.0%	0	0	0	0.0%	20	
Zinc, 200.7 Diss	.0186	0.005	0	0	0.0%	0	0	0.0188	1.1%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: **0203216-01A MS** Batch ID: **01 CN A-3/27/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/26/02**
Client ID: **GP03-03(56-60)** **0203216** Run ID: **HIT MAN_020327B** SeqNo: **113233**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.676	0.04	0.2	0.498	89.0%	75	125	0			

Sample ID: **0203200-09A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020330A** SeqNo: **114155**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	33.9	1	40	0	84.7%	0	234	0			
Benzene	39.4	1	40	0	98.5%	37	151	0			
Chlorobenzene	37.2	1	40	0	93.0%	37	160	0			
Toluene	38	1	40	0	95.0%	47	150	0			
Trichloroethene	41.2	1	40	2.55	96.6%	71	157	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	50.2	0	50	0	100.4%	86	118	0			
Toluene-d8	50.7	0	50	0	101.4%	88	110	0			

Sample ID: **0203221-07A MS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020401A** SeqNo: **114083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	8.42	1	10	0	84.2%	0	234	0			
Benzene	10.7	1	10	0	107.0%	37	151	0			
Chlorobenzene	10.1	1	10	0	101.0%	37	160	0			
Toluene	10.1	1	10	0	101.0%	47	150	0			
Trichloroethene	10.6	1	10	0	106.0%	71	157	0			
4-Bromofluorobenzene	53.8	0	50	0	107.6%	86	115	0			
Dibromofluoromethane	52.4	0	50	0	104.8%	86	118	0			
Toluene-d8	52.5	0	50	0	105.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Sample Matrix Spike

Sample ID: **0203216-01A MS** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **GP03-03(56-60)** **0203216** Run ID: **ICP_020328B** SeqNo: **113784**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.475	0.005	0.5	0	95.0%	70	130	0			
Arsenic, 200.7 Diss	.469	0.006	0.5	0	93.8%	70	130	0			
Barium, 200.7 Diss	.544	0.005	0.5	0.06	96.8%	70	130	0			
Chromium, 200.7 Diss	.486	0.005	0.5	0	97.2%	70	130	0			
Cobalt, 200.7 Diss	.483	0.005	0.5	0	96.6%	70	130	0			
Copper, 200.7 Diss	.494	0.005	0.5	0	98.8%	70	130	0			
Iron, 200.7 Diss	24.9	0.01	5	19.8	102.0%	70	130	0			
Lead, 200.7 Diss	.479	0.005	0.5	0	95.8%	70	130	0			
Magnesium, 200.7 Diss	43.4	0.05	5	38.2	104.0%	70	130	0			
Manganese, 200.7 Diss	2.5	0.005	0.5	2.02	96.0%	70	130	0			
Nickel, 200.7 Diss	.48	0.005	0.5	0.0069	94.6%	70	130	0			
Selenium, 200.7 Diss	.481	0.005	0.5	0	96.2%	70	130	0			
Silver, 200.7 Diss	.488	0.005	0.5	0	97.6%	70	130	0			
Titanium, 200.7	.499	0.01	0.5	0	99.8%	70	130	0			
Vanadium, 200.7 Diss	.486	0.005	0.5	0	97.2%	70	130	0			
Zinc, 200.7 Diss	.507	0.005	0.5	0.0244	96.5%	70	130	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Sample Matrix Spike Duplicate

Sample ID: **0203216-01A MSD** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**

Client ID: **GP03-03(56-60)** **0203216** Run ID: **ICP_020328B** SeqNo: **113785**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7 Diss	.473	0.005	0.5	0	94.6%	70	130	0.475	0.4%	20	
Arsenic, 200.7 Diss	.468	0.006	0.5	0	93.6%	70	130	0.469	0.2%	20	
Barium, 200.7 Diss	.543	0.005	0.5	0.06	96.6%	70	130	0.544	0.2%	20	
Chromium, 200.7 Diss	.485	0.005	0.5	0	97.0%	70	130	0.486	0.2%	20	
Cobalt, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.483	0.2%	20	
Copper, 200.7 Diss	.493	0.005	0.5	0	98.6%	70	130	0.494	0.2%	20	
Iron, 200.7 Diss	24.8	0.01	5	19.8	100.0%	70	130	24.9	0.4%	20	
Lead, 200.7 Diss	.475	0.005	0.5	0	95.0%	70	130	0.479	0.8%	20	
Magnesium, 200.7 Diss	43.4	0.05	5	38.2	104.0%	70	130	43.4	0.0%	20	
Manganese, 200.7 Diss	2.5	0.005	0.5	2.02	96.0%	70	130	2.5	0.0%	20	
Nickel, 200.7 Diss	.479	0.005	0.5	0.0069	94.4%	70	130	0.48	0.2%	20	
Selenium, 200.7 Diss	.482	0.005	0.5	0	96.4%	70	130	0.481	0.2%	20	
Silver, 200.7 Diss	.487	0.005	0.5	0	97.4%	70	130	0.488	0.2%	20	
Titanium, 200.7	.499	0.01	0.5	0	99.8%	70	130	0.499	0.0%	20	
Vanadium, 200.7 Diss	.485	0.005	0.5	0	97.0%	70	130	0.486	0.2%	20	
Zinc, 200.7 Diss	.506	0.005	0.5	0.0244	96.3%	70	130	0.507	0.2%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **01 CN A-3/27/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **HIT MAN_020327B** SeqNo: **113230**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.197	0.04	0.2	0	98.5%	86	121	0			

Sample ID: **LCSD** Batch ID: **01 CN A-3/27/** Test Code: **EPA 9010B** Units: **mg/L** Analysis Date: **3/26/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **HIT MAN_020327B** SeqNo: **113231**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide	.205	0.04	0.2	0	102.5%	86	121	0.197	4.0%	20	

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:
Client ID: **0203216** Run ID: **HORATIO_020401A** SeqNo: **114079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	15.5	1	20	0	77.5%	0	234	0			
Benzene	19.4	1	20	0	97.0%	37	151	0			
Chlorobenzene	18.9	1	20	0	94.5%	37	160	0			
Toluene	18.1	1	20	0	90.5%	47	150	0			
Trichloroethene	18.8	1	20	0	94.0%	71	157	0			
4-Bromofluorobenzene	52.7	0	50	0	105.4%	86	115	0			
Dibromofluoromethane	50.1	0	50	0	100.2%	86	118	0			
Toluene-d8	51	0	50	0	102.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

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CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:

Client ID: **0203216** Run ID: **HORATIO_020330A** SeqNo: **114151**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	47.1	1	50	0	94.2%	0	234	0			
Benzene	53.6	1	50	0	107.2%	37	151	0			
Chlorobenzene	51	1	50	0	102.0%	37	160	0			
Toluene	50.7	1	50	0	101.4%	47	150	0			
Trichloroethene	51.2	1	50	0	102.4%	71	157	0			
4-Bromofluorobenzene	52	0	50	0	104.0%	86	115	0			
Dibromofluoromethane	50.5	0	50	0	101.0%	86	118	0			
Toluene-d8	50.8	0	50	0	101.6%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4045** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**

Client ID: **0203216** Run ID: **ICP_020328B** SeqNo: **113782**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.468	0.005	0.5	0	93.6%	85	115	0			
Arsenic, 200.7	.468	0.006	0.5	0	93.6%	85	115	0			
Barium, 200.7	.481	0.005	0.5	0	96.2%	85	115	0			
Chromium, 200.7	.489	0.005	0.5	0	97.8%	85	115	0			
Cobalt, 200.7	.488	0.005	0.5	0	97.6%	85	115	0			
Copper, 200.7	.488	0.005	0.5	0	97.6%	85	115	0			
Iron, 200.7	5.08	0.01	5	0	101.6%	85	115	0			
Lead, 200.7	.484	0.005	0.5	0	96.8%	85	115	0			
Magnesium, 200.7	4.81	0.05	5	0	96.2%	85	115	0			
Manganese, 200.7	.487	0.005	0.5	0	97.4%	85	115	0			
Nickel, 200.7	.484	0.005	0.5	0	96.8%	85	115	0			
Selenium, 200.7	.474	0.005	0.5	0	94.8%	85	115	0			
Silver, 200.7	.477	0.005	0.5	0	95.4%	85	115	0			
Titanium, 200.7	.5	0.01	0.5	0	100.0%	85	115	0			
Vanadium, 200.7	.485	0.005	0.5	0	97.0%	85	115	0			
Zinc, 200.7	.486	0.005	0.5	0	97.2%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: **LCS-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**

Client ID: **0203216** Run ID: **MANFREDD_020327A** SeqNo: **113502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.5	0.1	1	0	50.0%	47	145	0			
Acenaphthylene	.51	0.1	1	0	51.0%	33	145	0			
Anthracene	.55	0.1	1	0	55.0%	27	133	0			
Benz(a)anthracene	.53	0.1	1	0	53.0%	33	143	0			
Benzo(a)pyrene	.5	0.1	1	0	50.0%	17	163	0			
Benzo(b)fluoranthene	.46	0.1	1	0	46.0%	24	159	0			
Benzo(g,h,i)perylene	.48	0.1	1	0	48.0%	1	219	0			
Benzo(k)fluoranthene	.56	0.1	1	0	56.0%	11	162	0			
Chrysene	.63	0.1	1	0	63.0%	17	168	0			
Dibenz(a,h)anthracene	.52	0.1	1	0	52.0%	1	227	0			
Fluoranthene	.62	0.1	1	0	62.0%	26	137	0			
Fluorene	.59	0.1	1	0	59.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	.48	0.1	1	0	48.0%	1	171	0			
Naphthalene	.48	0.1	1	0	48.0%	21	133	0			
Phenanthrene	.54	0.1	1	0	54.0%	54	120	0			
Pyrene	.54	0.1	1	0	54.0%	52	115	0			
2-Fluorobiphenyl	.57	0	1	0	57.0%	43	116	0			
4-Terphenyl-d14	.72	0	1	0	72.0%	33	141	0			
Nitrobenzene-d5	.5	0	1	0	50.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-4050** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **MANFREDD_020327A** SeqNo: **113503**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.57	0.1	1	0	57.0%	47	145	0.5	13.1%	30	
Acenaphthylene	.59	0.1	1	0	59.0%	33	145	0.51	14.5%	30	
Anthracene	.59	0.1	1	0	59.0%	27	133	0.55	7.0%	30	
Benz(a)anthracene	.55	0.1	1	0	55.0%	33	143	0.53	3.7%	30	
Benzo(a)pyrene	.54	0.1	1	0	54.0%	17	163	0.5	7.7%	30	
Benzo(b)fluoranthene	.51	0.1	1	0	51.0%	24	159	0.46	10.3%	30	
Benzo(g,h,i)perylene	.51	0.1	1	0	51.0%	1	219	0.48	6.1%	30	
Benzo(k)fluoranthene	.6	0.1	1	0	60.0%	11	162	0.56	6.9%	30	
Chrysene	.7	0.1	1	0	70.0%	17	168	0.63	10.5%	30	
Dibenz(a,h)anthracene	.51	0.1	1	0	51.0%	1	227	0.52	1.9%	30	
Fluoranthene	.65	0.1	1	0	65.0%	26	137	0.62	4.7%	30	
Fluorene	.61	0.1	1	0	61.0%	59	121	0.59	3.3%	30	
Indeno(1,2,3-cd)pyrene	.49	0.1	1	0	49.0%	1	171	0.48	2.1%	30	
Naphthalene	.57	0.1	1	0	57.0%	21	133	0.48	17.1%	30	
Phenanthrene	.56	0.1	1	0	56.0%	54	120	0.54	3.6%	30	
Pyrene	.61	0.1	1	0	61.0%	52	115	0.54	12.2%	30	
2-Fluorobiphenyl	.65	0	1	0	65.0%	43	116	0	0.0%	30	
4-Terphenyl-d14	.77	0	1	0	77.0%	33	141	0	0.0%	30	
Nitrobenzene-d5	.65	0	1	0	65.0%	35	114	0	0.0%	30	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **4/1/02** Prep Date:

Client ID: **0203216** Run ID: **HORATIO_020401A** SeqNo: **114078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	49.8	1	50	0	99.6%	80	120	0			
1,2-Dichloropropane	54.5	1	50	0	109.0%	80	120	0			
Chloroform	54.3	1	50	0	108.6%	80	120	0			
Ethylbenzene	51.3	1	50	0	102.6%	80	120	0			
Toluene	53.2	1	50	0	106.4%	80	120	0			
Vinyl chloride	49.4	1.2	50	0	98.8%	80	120	0			
4-Bromofluorobenzene	50.3	0	50	0	100.6%	86	115	0			
Dibromofluoromethane	50.9	0	50	0	101.8%	86	118	0			
Toluene-d8	52.3	0	50	0	104.6%	88	110	0			

Sample ID: **CCV** Batch ID: **05 8260 A-4/2** Test Code: **EPA 8260B** Units: **µg/L** Analysis Date: **3/30/02** Prep Date:

Client ID: **0203216** Run ID: **HORATIO_020330A** SeqNo: **114150**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	19.88	1	20	0	99.4%	80	120	0			
1,2-Dichloropropane	20.8	1	20	0	104.0%	80	120	0			
Chloroform	20.3	1	20	0	101.5%	80	120	0			
Ethylbenzene	20.85	1	20	0	104.3%	80	120	0			
Toluene	20	1	20	0	100.0%	80	120	0			
Vinyl chloride	21.75	1.2	20	0	108.8%	80	120	0			
4-Bromofluorobenzene	51.5	0	50	0	103.0%	86	115	0			
Dibromofluoromethane	49.2	0	50	0	98.4%	86	118	0			
Toluene-d8	50.5	0	50	0	101.0%	88	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: **CCV** Batch ID: **4050** Test Code: **8270-SIM** Units: **µg/L** Analysis Date: **3/27/02** Prep Date:
Client ID: **0203216** Run ID: **MANFREDD_020327A** SeqNo: **113501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.1	1	0	110.0%	80	120	0			
Acenaphthylene	1.16	0.1	1	0	116.0%	80	120	0			
Anthracene	1.16	0.1	1	0	116.0%	80	120	0			
Benz(a)anthracene	1.04	0.1	1	0	104.0%	80	120	0			
Benzo(a)pyrene	1.02	0.1	1	0	102.0%	80	120	0			
Benzo(b)fluoranthene	.98	0.1	1	0	98.0%	80	120	0			
Benzo(g,h,i)perylene	.94	0.1	1	0	94.0%	80	120	0			
Benzo(k)fluoranthene	1.11	0.1	1	0	111.0%	80	120	0			
Chrysene	1.11	0.1	1	0	111.0%	80	120	0			
Dibenz(a,h)anthracene	1	0.1	1	0	100.0%	80	120	0			
Fluoranthene	1.2	0.1	1	0	120.0%	80	120	0			
Fluorene	1.02	0.1	1	0	102.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.92	0.1	1	0	92.0%	80	120	0			
Naphthalene	1.11	0.1	1	0	111.0%	80	120	0			
Phenanthrene	1.05	0.1	1	0	105.0%	80	120	0			
Pyrene	1.07	0.1	1	0	107.0%	80	120	0			
2-Fluorobiphenyl	1.12	0	1	0	112.0%	43	116	0			
4-Terphenyl-d14	1.15	0	1	0	115.0%	33	141	0			
Nitrobenzene-d5	1.12	0	1	0	112.0%	35	114	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: *05-Apr-02*

CLIENT: Limno-Tech, Inc.
Work Order: 0203216
Project: PDX WAC/Walker Slitronics

QC SUMMARY REPORT

Minerals ICV for ICP

Sample ID: **ICVHI** Batch ID: **4045** Test Code: **EPA 6010B** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **ICP_020328B** SeqNo: **113780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	25.6	0.01	25	0	102.4%	90	110	0			
Magnesium	24.9	0.05	25	0	99.6%	90	110	0			
Titanium	5.05	0.01	5	0	101.0%	90	110	0			

Sample ID: **ICVLOW** Batch ID: **4045** Test Code: **EPA 200.7** Units: **mg/L** Analysis Date: **3/28/02** Prep Date: **3/26/02**
Client ID: **0203216** Run ID: **ICP_020328B** SeqNo: **113779**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony, 200.7	.491	0.005	0.5	0	98.2%	95	105	0			
Arsenic, 200.7	.495	0.006	0.5	0	99.0%	95	105	0			
Barium, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			
Chromium, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Cobalt, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Copper, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Iron, 200.7	.494	0.01	0.5	0	98.8%	95	105	0			
Lead, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			
Manganese, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Nickel, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			
Selenium, 200.7	.498	0.005	0.5	0	99.6%	95	105	0			
Silver, 200.7	.499	0.005	0.5	0	99.8%	95	105	0			
Vanadium, 200.7	.5	0.005	0.5	0	100.0%	95	105	0			
Zinc, 200.7	.501	0.005	0.5	0	100.2%	95	105	0			

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

ENVIRONMENTAL SERVICES LABORATORY – GLOSSARY OF FLAGS

QUALIFIER	DESCRIPTION
AA	This sample was analyzed after the holding time had expired.
AB	The hydrocarbon pattern in this sample is not typical of gasoline.
AC	The hydrocarbon pattern in this sample is not typical of diesel.
AD	The hydrocarbon pattern in this sample is not typical of oil.
AE	The hydrocarbon pattern in this sample extends into the gasoline range.
AF	The hydrocarbon pattern in this sample extends into the diesel range.
AG	The hydrocarbon pattern in this sample extends into the oil range.
A	This analysis was performed on a VOA sample containing headspace.
B	Analyte detected in the Method Blank above the reporting level.
C	The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
D	The sample was supplied in an inappropriate container according to method criteria.
E	This value is above the quantitation limit. It is considered an estimate.
H	The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
J	The result is above the Method Detection Limit (MDL) and below the Reporting level (RL). It is considered an estimate.
M	The MS/MSD recoveries are not calculable due to a high amount of analyte in sample.
MI	This indicates a high level of matrix interference affecting the spike or surrogate recovery.
N	See case narrative.
O	Detection Limits are elevated due to sample dilution. See case narrative.
Q	Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
R	The RPD result is outside method control limits. See other qualifiers or case narrative.
S	The spike recovery is outside method control limits. See other qualifiers or case narrative.
T	The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
X	Unable to quantitate surrogate recovery due to sample dilution.

Environmental Services Laboratory, Inc

CHAIN OF CUSTODY

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520 • FAX (503) 670-9243

Company: Limno-Tech, Inc
Project Manager:
LABORATORY # 0203216
Address: 4640 SW Macadam Ave Suite 60 Portland, OR
Phone: 503-248-1768 Fax: 503-248-1959

SAMPLE DISPOSAL INSTRUCTIONS

ANALYSIS REQUEST

	SAMPLE ID	DATE	TIME	MATRIX	LAB ID	NWTPH-HCID	NWTPH-GX	NWTPH-DX	8020M - BETX only	8270 SIMS PAHs	Halogenated VOCs/GCMS	Aromatic VOCs/GCMS	8260 GCMS Volatiles	8270 GCMS Semivolatiles	8081 GC Pesticides/PCBs	8081m PCBs only	RCRA Metals (8)	Priority Pollutant Metals (13)	Metals:	TCLP Metals (8)	TCLP Volatiles 8260 ZH-EXT	TCLP Semivolatiles 8270	T-Cy⁻ (9010)	# OF CONTAINERS
FF	GP03-03 (56'-60')	3/22/02	09:45	W	01					X			3	1					1				1	6
FF	GP03-03 (96'-100')	3/22/02	10:30	W	02					X			3	1					1				1	6
VOT	Screen Blank	3/22/02	09:00	W	03					X			3	1										4
NOT	Trip Blank	—	—	W	04								1											1

(LOW DETECTION LIMITS NEEDED ESPECIALLY FOR CHLORINATEDS)

PROJECT INFORMATION	SAMPLE RECEIPT
PROJECT NUMBER: Wacker Sitron 105	TOTAL NUMBER OF CONTAINERS
PROJECT NAME: PDXWAC	COC SEALS INTACT? Y / N / NA
PURCHASE ORDER NUMBER:	RECEIVED INTACT? Y / N
ONGOING PROJECT? YES ☑ NO ☐	RECEIVED COLD? Y / N

PRIOR AUTHORIZATION REQUIRED FOR RUSH PROJECTS

TAT (NORMAL) 2 WKS (RUSH) ☐ 24 HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK

GREATER THAN 24 HR. NOTICE? YES ☐ NO ☐ (LAB USE ONLY)

SPECIAL INSTRUCTIONS: VOC's (8260B); PAH (8270 SIM); Total Cy⁻ (9010); Metals: Sb, As, Ba, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Ti, Va, Zn (6010/700 245.1, 200.7)

Sampled by: Joyce S Dunkin
Received via:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
SIGNATURE: Joyce S Dunkin Time 12:35	SIGNATURE: Time	SIGNATURE: Time
Printed Name: Joyce S Dunkin Date 3/22/20	Printed Name: Date	Printed Name: Date
Company:	Company:	Company:
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: [signature] Time 1230	Signature: Time	Signature: Time
Printed Name: Date 3/22/02	Printed Name: Date	Printed Name: Date
Company:	Company:	ESL Inc.:

DISTRIBUTION: White, Canary - ESL, Pink - Originator

PRELIMINARY SOURCE CONTROL EVALUATION REPORT
WACKER SILTRONIC CORPORATION PROPERTY

Prepared for

NW Natural

220 NW 2nd Avenue

Portland, OR 97209

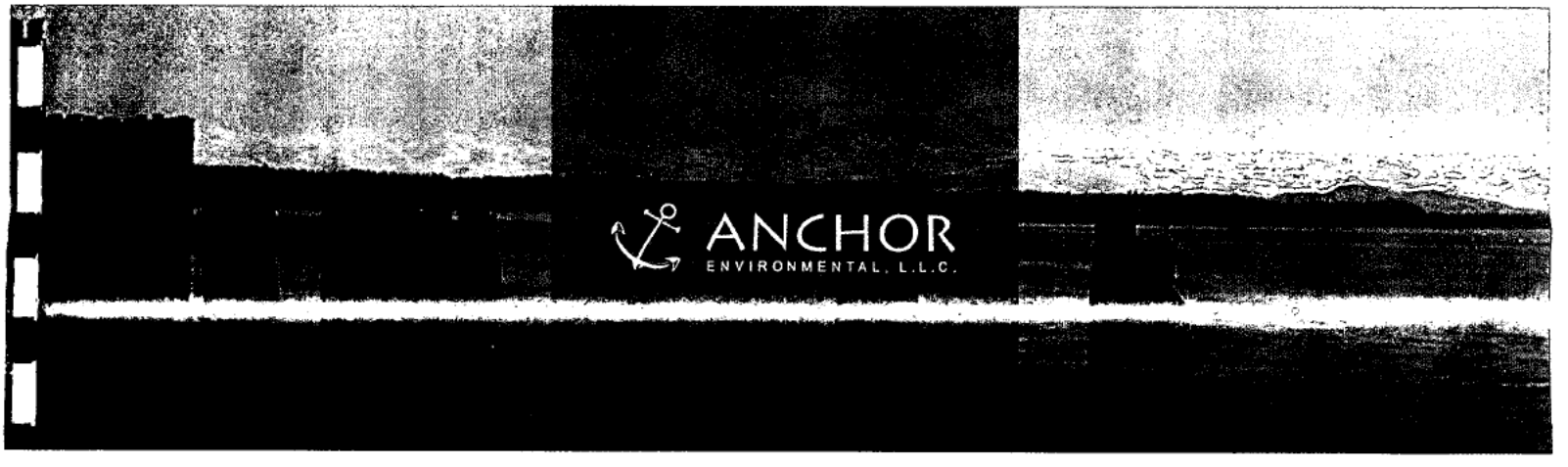
Prepared by

Anchor Environmental, L.L.C.

and

Hahn and Associates, Inc.

November 2003



PRELIMINARY SOURCE CONTROL EVALUATION REPORT
WACKER SILTRONIC CORPORATION PROPERTY

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November 2003

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SCOEPA00011910

1 INTRODUCTION

This Preliminary Source Control Evaluation was prepared in support of the Remedial Investigation (RI) activities being conducted at the Wacker Siltronic Corporation (Wacker) property (Figures 1 and 2). The RI activities at the Wacker property are to be completed per an Order (DEQ No. EVC-NWR-00-27) issued jointly to both NW Natural and to Wacker by the Oregon Department of Environmental Quality (DEQ), dated October 4, 2000. The sole stated purpose of the Order is to provide for the completion of RI activities sufficient in scope to "determine the nature and extent of releases of hazardous substances to Willamette River sediments from certain property in Multnomah County, and to develop and implement source control measures, if necessary."

The Final Focused Remedial Investigation Work Plan (Hahn and Associates, Inc. [HAI] 2001) provides the rationale and approach for meeting the purpose of the Order. This Preliminary Source Control Evaluation, described under Section 8 of the Work Plan (HAI 2001), presents and evaluates data relevant to the characterization of potential chemical migration pathways from the Wacker property to the Willamette River sediments. Potential surface water, groundwater, and soil migration pathways to the Willamette River are discussed.

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2 BACKGROUND

The Work Plan (HAI 2001) provides background information on the Wacker site, including a conceptual model for the hydrogeology and the nature of contamination at the site as it may pertain to potential sediment impacts. Elements of this information are summarized in the following sections.

2.1 Site Location and Description

Wacker operates a silicon wafer fabricating facility at this 85-acre site along the western bank of the Willamette River in a section of northwest Portland (Figures 1 and 2). The property boundaries include the Willamette River to the northeast, BNSF railroad berms to the southwest and southeast, and a property line shared with NW Natural and its tenant, Koppers Industries, Inc. (KII) to the northwest (i.e., the former Gasco facility property).

Presently, the Wacker site is approximately 50 to 60 percent developed with two silicon fabrication plants (Fab 1 and 2) and associated wastewater treatment plants and structures, as well as a Portland General Electric (PGE) substation, an administration building, and parking facilities (Figure 2). A majority of the development activities to date have occurred within the northeastern and northwestern portions of the property, extending nearly the full length of the shared property line with NW Natural. Much of the southern portion of the site is currently undeveloped. Access to the site is limited due to the site's proximity to the river and railroad grades. The active portions of the facility are fenced, and the area is patrolled by private security personnel.

Additional site features include a narrow greenway that has been created along the full riverfront portion of the property, as well as an approximately 100-foot wide City of Portland utility easement that divides the property from the northwest to the southeast (Figure 2).

2.2 Potential Sources of Contamination

The Strategy Recommendation Report prepared by Mr. Eric Blischke of the DEQ in October 1999 (DEQ 1999) and the follow-up Supplement to DEQ's Strategy Recommendation Report (Bridgewater Group 2000), contain detailed summaries of identified site contamination, as

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mag?

well as a description of all known chemical releases reported to have occurred at the site. The identified potential sources of contamination are summarized in the following sections.

2.2.1 Former Gasco Facility

Historical aerial photographs indicated that historical operations associated with oil gasification processes at the former Gasco site may have impacted the Wacker site. The area of concern is the strip of former low-lying property, approximately 400-feet wide, located immediately south of the present day NW Natural/Wacker property boundary (Figure 2). This low area may have received discharges and overflow from adjacent effluent ponds with potential subsequent discharge via a rerouted creek entering the Willamette River opposite a berm at the southern end of the lowland area. It has been speculated (PDC 1985) that this low area may have received discharge or placement of oil-water emulsifications, tar, lampblack, spent oxide, as well as building debris. Finally, based on observations made during various geotechnical and environmental investigations completed at the Wacker site, it appears possible that Gasco-related materials may have been a component of fill placed at other portions of the Wacker property after it was sold by NW Natural.

2.2.2 Former Western Transportation Terminal

Western Transportation, which operated a fueling dock at the southeast corner of the Wacker site (Figure 2), had two large above ground fuel tanks. The occurrence of leaks, spills, or waste disposal activities associated with these tanks are unknown; however, according to DEQ (1999), a U.S. Environmental Protection Agency (USEPA) analysis of a 1970 aerial photograph concluded that soils in this area were stained. The photograph indicates that the discolored soils appear to be limited to the immediate vicinity of the Western Transportation structures.

2.2.3 Olympic Pipeline

Olympic Pipeline uses two product lines within a utility corridor traversing the central portion of the Wacker property (Figure 2). One of these pipelines is used to transport diesel and kerosene, and the other is used to transport gasoline. In February 1979, Wacker discovered the presence of petroleum while excavating an area near the Fab 1 wastewater treatment plant area (Figure 2). An initial sample of impacted soil from the excavation was found to contain hydrocarbons matching a sample of diesel fuel

CHROME

SHOW DATA ON
EXACT AMOUNT OF
CHROME [illegible]
LAB SHEETS!

obtained from one of the pipelines; however a second sample apparently did not match the Olympic Pipeline product (DEQ 1999).

Subsequently, Olympic Pipeline exposed their pipelines. Holes were found in the pipelines and floating oil product was identified within the utility corridor to the northwest and southeast of the excavation. Olympic Pipeline replaced the leaking section of pipe, removed floating product from the excavation, and removed residual oil stained soils in the bottom of the excavation area (Bridgewater Group 2000).

2.2.4 Wacker Operations-Related Chemical Related Releases

Over the past twenty years, a number of incidents involving the release of hazardous substances to the environment have occurred at the Wacker facility, as described below.

1980 Chromium Release

On December 16, 1980, chromic acid was found within the concentrated acid system of the Wacker wastewater treatment plant. An estimated 5.5 pounds of chromium was captured and disposed. Although no chromic acid was reportedly released to soil underlying the wastewater treatment plant in the western corner of the site, an estimated 1.3 pounds of chromium was discharged to the Willamette River through the combined effluent outfall near the northern corner of the property (Figure 2). According to Bridgewater Group (2000), Wacker conducts permitted discharges of chromium to the Willamette River of up to 11 pounds per year.

1981 Chromic and Nitric Acid Leak

Approximately 6,000 gallons of acid etch solution and rinse water were spilled at the Materials Characterization Production Area (Fab 1 Building) in 1981 (Figure 2). Some of the spilled material was collected within a sump, while the remainder was reportedly collected within the overfilled above-ground storage tank's secondary containment. No release to underlying soil or surface water was documented as a result of this spill (Bridgewater Group 2000).

1984 Trichloroethylene Spills and Underground Storage

Spills at the trichloroethylene (TCE) stripper unit (immediately west of the Fab 1 Building) occurred on December 3, 1984 (0.33 gallons), and again on December 31, 1984

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TCE
ABOVE GROUND SYS.
OPERATION STARTED
IN 1980.

DETECTION LIMIT?
SOUNDS LIKE A
FALSE DATA
POINT. RESAMPLE
AT LOWER DETECT.
FOUND "ZERO."

(11.6 gallons) (Bridgewater Group 2000) (Figure 2). As a result, Wacker removed 128 cubic yards of soils, and confirmation soil samples indicated TCE concentrations of less than 1 part per million (ppm) TCE remaining in the soil. No groundwater sampling was conducted. Wacker reportedly received a letter of "No Further Action" regarding the TCE spill from the DEQ in 1985. Wacker ceased the use of TCE at the facility in 1988 (Bridgewater Group 2000).

As documented in a December 2002 report prepared by Maul Foster & Alongi, Inc. (MFA 2002), between 1981 and 1984, Wacker utilized an underground solvent recovery system for TCE reclamation. This solvent recovery system included three underground storage tanks (USTs) which were physically removed in 1985 after start-up of the above-ground TCE stripper referenced above. Although no evidence of contamination was reported, no sampling was conducted as part of UST removal activities. The location of the former UST system is depicted on Figure 2.

1987 Organic Wastewater Overflow

Approximately 2,000 gallons of weak detergents and surfactants from the organic wastewater system overflowed onto a gravel yard and roadway on the Wacker property in June 1987. The overflow entered a stormwater catch basin, with subsequent discharge to the Willamette River from the combined effluent/outfall located near the northern corner of the property (Figure 2). Soil sampling in the spill area did not identify the presence of contaminants, and no cleanup was necessary.

1988 Pentachlorophenol Detection in Wastewater

On January 11, 1988, pentachlorophenol (PCP) was identified within one of Wacker's wastewater effluent samples at a concentration of 0.2 ppm. Follow-up sampling conducted on January 27, 1988, indicated the presence of PCP in a combined effluent sample at a concentration of 0.004 ppm. Further follow-up testing of the combined effluent in February, March, and April 1988, did not identify the presence of PCP at concentrations greater than the analytical detection limit of 0.005 ppm (Bridgewater Group 2000). The source of the PCP identified within the wastewater effluent was not ascertained.

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1991 Weak Acid Storage Tank Leak

Approximately 4,000 gallons of weak acid (spent, de-ionized rinse water) was released to the ground at the wastewater treatment plant area (Figure 2) on September 11, 1991. Wacker blocked all storm drains in order to contain the spilled material, after which approximately 1,000 gallons of the acid was recovered. DEQ concluded the release was not a hazardous waste, did not exceed reportable quantity, did not exceed National Pollutant Discharge Elimination System (NPDES) effluent limits, and further investigation was not necessary (Bridgewater Group 2000).

1997 Caustic Rinse Water Release

On April 28, 1997, caustic rinse water from an ion-exchange regeneration unit, containing an estimated 50 pounds of caustic (pH reportedly ranging from 7.4 to 11.3), was accidentally sprayed onto bare ground west of the Fab 1 Building (Figure 2). The spilled caustic solution was neutralized then recovered with a vacuum truck. Soil samples collected from the area indicated the presence of soils with a pH of up to 11.6, greater than the control sample pH of 7.6. Based on these results, the upper 6 inches of soil were scraped off. Resampling of remaining soil indicated pH was similar to the control sample (Bridgewater Group 2000).

2.3 Contaminants of Interest

DEQ identified within the Strategy Recommendation Report (DEQ 1999) several Contaminants of Interest (COIs) at the Wacker site. With few exceptions, these COIs were those identified by DEQ as being present within sediments adjacent to the site at concentrations considered to exceed Portland Harbor baseline values. In addition, DEQ identified BTEX (benzene, toluene, ethylbenzene, and xylenes) compounds and total cyanide as COIs because of previous detections in site groundwater. Also, TCE was recently considered by DEQ as a COI because of the past two TCE spills that occurred in the Fab 1 Building area at the site in 1984.

However, herbicides, pesticides, and phthalates, identified within the DEQ Strategy Recommendation Report as having been detected within adjacent sediments at concentrations exceeding the Portland Harbor baseline, have not been considered as COIs in

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METALS

COC's
TCE, Cr

RI documents for this site. This is because these compounds appear to be due primarily to other ubiquitous sources in Portland Harbor, and no on-site sources have been identified.

Ecological risk evaluation studies completed to date with regard to sediments at the NW Natural site indicate that concentrations of metals, only slightly greater than the Harbor Baseline, do not appear to pose unacceptable risks. However, due to the occurrence of several acid spills at the Wacker site, and the potential for resulting acid-induced mobilization of naturally-occurring metals from the soils, those metals identified by the DEQ as being present in the sediments at concentrations slightly above baseline concentrations, have been identified as COIs for the purposes of the RI.

As documented in the Work Plan (HAI 2001), the following COIs have been identified for the Wacker RI:

- Polynuclear aromatic hydrocarbons (PAHs)
- Semi volatile organic compounds (SVOCs), including carbazole, dibenzofuran, 2-methylnaphthalene, and phenols
- Volatile organic compounds (VOCs), including BTEX and TCE
- Total cyanide
- Metals (antimony, arsenic, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, silver, titanium, vanadium, and zinc)

This Preliminary Source Control Evaluation identifies and evaluates the potential contaminant migration pathways of these COIs into the Willamette River.

2.4 Transport and Fate

Because primary contaminant type, mode of placement, and the hydrogeological framework are similar at both the Wacker and Gasco facilities, contaminant transport and fate processes are also expected to be similar. Figure 3 presents a conceptual diagram of the transport and fate of contaminants.

2.4.1 Groundwater Pathway

As reported in HAI 2003, groundwater is interpreted to occur in three principal hydrologic zones beneath the site, which from top to bottom include:

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- The unconfined Surficial Fill water-bearing zone (WBZ)
- The semi-confined Alluvial WBZ
- The confined bedrock aquifers in the Columbia River Basalts

A laterally extensive low permeability silt layer (i.e., upper Alluvial Unit) separates the Surficial Fill WBZ from the Alluvial WBZ across a majority of the site.

Based on Focused RI results at the Wacker property, and consistent with RI results at the Gasco property, the most significant potential for contaminant migration in groundwater occurs within the Alluvial WBZ. For example, results of continuous water level monitoring at Wacker and Gasco (HAI 2003), indicate the presence of a direct and rapid response to tidally-influenced changes in Willamette River elevation within the shoreline Alluvial WBZ wells, while a similar, but subdued and delayed response to Willamette River tidal fluctuations was observed at a greater distance from the river in an interior Alluvial WBZ well. The preceding suggests direct hydraulic communication between the Willamette River and the Alluvial WBZ.

With regard to the Surficial Fill WBZ, results of continuous water level monitoring did not identify a direct relationship between tidal fluctuations of the Willamette River and water levels. Further, the occurrence of the Surficial Fill WBZ at certain locations of the site, including those adjacent to the river, were found to be seasonally dependent. This suggests that although discharge of groundwater from the Surficial Fill WBZ to the Willamette River is expected, it appears that a degree of isolation exists between these features. However, because the fill unit is partially within the saturated zone, and groundwater elevation data suggesting flow towards the river, this unit has also been evaluated herein as a potential contaminant migration pathway to the river.

2.4.2 Non-Aqueous Phase Liquid Migration Pathway

Historical information suggests the possibility that oil and tar [non-aqueous phase liquid (NAPL)] may have been historically placed within the northern lowland portion of the Wacker site. The tar may also have historically discharged into the river via scouring or overflow into the adjacent channelized creek that no longer exists. Additionally, it has been speculated that demolition debris, as well as consolidated soils from the tar pond

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NO MIGRATION?

close-outs, may have been incorporated into fill placed elsewhere at the Wacker site (HAI 2001).

With regard to field screening of subsurface soils at the Wacker property, references to bitumen and tar, potential byproducts from the oil gasification process, have been identified as being present in surficial fill within numerous soil borings that were installed at the site prior to the completion of Focused RI activities. Of the borings installed as part of Focused RI activities at the site, borings P-1, P-4, P-5, P-7, GP-02-01, and GP-02-02 identified the presence of thin (0.5 to 1.5 feet thick) zones of weathered tar or oil within the fill. At borings P-1, GP-02-01, GP-02-02, and P-7, the weathered tar or oil was identified at the base of the fill, on what was likely the pre-fill ground surface. It is noted that the oil identified at the P-7 location correlates with the area of possible discolored soils, as identified in 1970 aerial photograph of the site, as being present in the immediate vicinity of the former Western Transportation structures (HAI 2003).

Although oil and tar have been identified at numerous locations at the site, no field screening evidence of oil or tar below the zone of Surficial Fill unit has been identified. Further, evidence of migration of oil or tar from the Surficial Fill to Willamette River sediments, or to the shoreline from on-going upland sources, have not been identified. Instead, it appears that the product was either placed on the ground prior to filling, or that the product was incorporated into the fill during placement.

Based on the preceding, ongoing NAPL migration to the river is not considered to be occurring, and therefore this pathway is not further analyzed in this report.

2.4.3 Surface Water Runoff Pathway

Stormwater runoff at the Wacker property is collected within catch basins and is subsequently conveyed to the Willamette River via three on-site outfalls. The exception involves the administration building parking lot stormwater runoff that is piped approximately 100 feet off-site to the southeast where it discharges to the City of Portland storm sewer (Outfall 22C), which in turn, discharges to the Willamette River immediately upstream of the Wacker property. In addition, there is an off-site ditch that feeds into Outfall 22C. A source evaluation for Outfall 22C is not included in this report

because NW Natural, at DEQ's request, has submitted a work plan for additional sampling to evaluate the potential migration of specific chemicals from the Wacker property to this outfall. When these additional data are collected, these data will be presented in an addendum to this source control evaluation report. However, because of the ongoing nature of these studies, they are not being addressed in this report at this time.

2.4.4 Soil Erosion and Catch-Basin Sediment Transport

The only other potential pathway to the Willamette River would involve incidental erosion of soils into the river either directly from the river embankment and/or via transport through the stormwater system.

According to the National Flood Insurance Program, Flood Insurance Rate Map (FIRM) that covers the Wacker site, the bulk of the property is situated within Flood Zone B. This zone is described as an area within the 500-year flood zone; an area within the 100-year flood zone with average depths less than one foot and a drainage area less than one square mile; or areas protected by levees from the 100-year flood. Flooding of the Willamette River during February 1996 resulted in damage and limited bank erosion; however, no flood waters encroached upon the portion of the site above the top of the shoreline embankment. The full length of the property's shoreline is stabilized with rock rip-rap designed to prevent riverbank erosion. In addition, areas above the ordinary high water line are permanently vegetated. Consequently, direct contact between river water and site soils and/or erosion of embankment soils via surface water sheet flow into the river is not expected to be a substantial pathway of contaminant migration.

Since stormwater runoff at the site is collected in catch basins and transported to the river via a pipe system, there is also a potential for incidentally eroded soils from other areas of the site entering and eventually discharging from the stormwater system. Because most of the site is paved or otherwise stabilized, substantial erosion and transport of site soils through the stormwater system is not expected. The stormwater system could also be a transport mechanism for any accidental or incidental spills or releases of contaminants directly to paved surfaces.

2.4.5 Air Pathway

Contaminants in soils could volatilize to the air or be suspended in the air as dust, but only a tiny fraction of any volatilized or dust borne constituents would be expected to be transported to the river. Therefore, this cannot be considered a significant pathway and is not analyzed further in this report.

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3 PRELIMINARY RIVER SOURCE EVALUATION

As part of the Phase I RI, data were collected in 2000 and 2001, and these data were used for this preliminary source evaluation (see Figure 2 for sample locations). Groundwater data were collected near the groundwater/river water interface with the objective of obtaining sufficient information to allow for an evaluation of the need to implement source control measures at the site. Surface water data were obtained from site outfalls during a storm event for the same overall purpose of evaluating potential sources to the river. Soils data were also collected as part of the Phase I RI; however, since upland soil erosion was not identified as a likely contaminant migration pathway to the river, most of the soil data were not used for this preliminary source evaluation. Soil data collected at the Fab 2 stormwater outfall and stormwater catch basins were included in this preliminary source evaluation as potential sources of contaminants being transported via the stormwater system.

As discussed in the previous section, a list of COIs has been identified for purposes of the Wacker RI. This preliminary source evaluation evaluates the potential for these chemicals to enter the river in substantial concentrations. To address this question, preliminary and conservative screening was conducted. For the chemicals that passed through this conservative screening, site-specific conditions and fate/transport processes were preliminarily evaluated to determine the likelihood that these chemicals might enter the river at concentrations of potential concern.

This evaluation is preliminary in nature. Chemicals and/or areas that appear to be of potential concern after this evaluation are not confirmed sources to the river. Rather, the purpose of this evaluation is to define those chemicals and areas where further detailed analysis would be reasonable. This could include additional analysis of existing data, modeling using existing data, and/or additional data collection on the site and/or in the river to support further more detailed evaluations.

3.1 Screening Criteria and Methodology

A conservative screening was conducted to identify those chemicals from the list of COIs that may potentially be found in site groundwater or surface water in concentrations high enough to indicate the need for further evaluation.

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The following ambient surface water quality criteria and guidelines (in the form of concentrations), which are protective of both aquatic ecosystems and human health, were used for the toxicity assessment (Table 1):

- USEPA (2002) National Recommended (Ambient) Water Quality Criteria (AWQC) for the protection of aquatic life (freshwater chronic and acute)
- USEPA (2002) AWQC for the protection of human health (consumption of organisms only)
- DEQ Guidance for Ecological Risk Assessment Level II Screening Level Values (SLVs)

Following DEQ guidance provided in its September 9, 2003, letter to NW Natural (DEQ 2003), and the Draft Portland Harbor Source Control Strategy document (DEQ and USACE 2003), the USEPA criteria were selected for the screening process; however, if none were available, the DEQ SLVs were used. The DEQ SLVs are strictly for ecological risk assessment purposes, so human health screening level criteria came only from the USEPA criteria. It should be noted that USEPA criteria relevant to human health consumption of water were not included in this evaluation because this is not a designated beneficial use for the Willamette River (OAR 340-41-442, Table 6, 2003). Chemicals for which there were no criteria available were not carried through the screening process. Also, although SLVs based on secondary toxicity values are available for iron and manganese, the applicability of these levels to natural waters (particularly groundwater) that tend to have considerable background levels of these metals is questionable. Consequently, iron and manganese were not screened in this draft evaluation.

The above criteria were compared directly to groundwater data to screen for the potential for chemicals in groundwater to discharge to the river. For stormwater, data were screened using five times the chronic AWQC for aquatic life, if available; and if not, five times the DEQ SLV was used. This screening procedure is also based on the screening process described in DEQ's September 9, 2003 letter (DEQ letter 2003) and DEQ's draft Portland Harbor Joint Source Control Strategy. The potential risk to human health as a result of stormwater was screened using five times the AWQC criteria for the protection of human health based on fish consumption.

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Two separate screenings were performed to address both human and ecological potential risk. Concentrations were compared to the above identified screening criteria to determine which chemicals exceeded the human and/or ecological screening criteria. Non-detect values were not included in this screening. Hazard quotients (HQ = concentration/screening criteria) were then calculated to determine the magnitude of exceedances. Chemicals that exceeded either human health or ecological criteria were analyzed further to determine the potential for migration to the Willamette River in significant concentrations (see Section 3.3).

Soil data collected at the Fab 2 stormwater outfall and catch basins were screened based on the DEQ SLVs for freshwater sediments. Again, this approach is consistent with DEQ's draft Portland Harbor Joint Source Control Strategy document.

Tables 2, 3, and 4 provide summaries of the criteria that were selected from Table 1 (based on the decision process outlined above) for comparisons to site data.

3.1.1 Applicability of Screening Criteria to Site Specific Conditions

Surface water quality criteria are useful as initial screening tool, but their applicability to this particular situation should be considered in the screening process. Information on each type of criterion is presented below.

Human Health Criteria for Waters

Comparisons to fish consumption criteria are extremely conservative, especially when compared to site-specific conditions. For organic chemicals with the potential to bioaccumulate in the aquatic food chain, these USEPA human health criteria are heavily affected by the fish portion of the diet and assume consistently high levels of consumption of fish residing in the affected water body by people over an entire lifetime. While these criteria assumptions may be appropriate when applied to some surface waters, they are likely very conservative for this reach of the Willamette River.

The default assumption for existing AWQC is a fish consumption rate of 17.5 grams per day for a lifetime. Fish meal sizes can vary considerably, but the reported national average is about 126 grams per meal (USEPA 1997). Accordingly, the standard USEPA

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approach assumes that someone would catch and eat approximately 50 meals of fish annually from the site in question.

While it is possible that people may eat this number of fish meals annually from this industrial stretch of the Willamette River, it is extremely unlikely that as many as 50 meals per year would come from directly in front of the Wacker Site. It is even more unlikely that such a consumption rate would be sustained for a lifetime.

In addition, the use of five times this criteria for stormwater discharges is also very conservative. This is because fish exposure near stormwater outfalls would occur in the river only after dilution has occurred and concentrations in fish tissue would be determined by the average concentration in the water over a long period, not just during the discharge of stormwater. The dilution factor expected for most fish exposures would likely be well in excess of five times due to the large size of the river, and constant exposure to these stormwater concentrations is impossible since stormwater discharges are intermittent.

Ecological Criteria for Waters

Freshwater ecological criteria are based on a variety of methods. Usually, they are derived from laboratory bioassays. In general, it is assumed that the freshwater criteria available are applicable to Willamette River conditions. However, substantial dilution would be expected to occur in groundwater as it approaches the surface water transition zone, which is a well understood process discussed in detail by standard texts on the subject (Boudreau 1996 and DiToro 2001). Similarly, substantial dilution of stormwater discharges would occur in the river within small distances of the outfall location.

Ecological Criteria for Soils

The use of the DEQ SLVs for sediments for the purposes of screening soil and sediment data from banks near outfalls and catch basins at the Wacker site are conservative because the criteria are based on concentrations found in bed sediments in the river where exposure to aquatic organisms would occur. If these soils are eroded or discharged from a catch basin and enter the river, the soil particles and the chemicals attached to them would be subject to mixing and dispersion as they enter the river water, and would likely spread over larger areas than their current locations. Therefore,

these sediments would not be deposited with the same chemical concentrations that are found within the catch basins or at the outfalls. For this reason, the comparison of these upland soils data to aquatic sediment criteria is an extremely conservative screening approach.

3.2 Screening Results

Tables 5 and 6 present a list of the chemicals in groundwater that had hazard quotients greater than one, which indicates they were present at concentrations above the screening criteria used in this evaluation. Tables 7 and 8 present the list of chemicals in surface water and soils, respectively, that had hazard quotients greater than one. Figures 4a, 4b, and 5 show the locations of the groundwater exceedances, and Figures 6 and 7 show the locations of the stormwater and soil exceedances. The screening results only include detected values.

Some relatively high level exceedances were found at Stations GP-2-01, GP-2-02, and GP-2-03; however, these sampling locations are set back 200 to 500 feet from the shoreline. These exceedances are shown on the summary tables and figures but are not necessarily most representative of potential discharges to the river. This is because the GP-2 wells are up-gradient of several stations closer to the river. The stations closer to the river in the same strata (i.e., P-2, P-3, and GP-7) would be more representative of chemical concentrations likely to be transported to the river via that strata.

Chemicals of note were identified and are listed below because they have relatively high HQs and/or are found at several locations with HQ's greater than one. Generally, chemicals with HQs slightly above one in only one or a few locations are not discussed in detail below.

Ecological Groundwater

For ecological criteria, chemicals of note include:

- ***Metals*** – Including barium, chromium, copper, zinc, lead, nickel, zinc, selenium, and vanadium. Relatively high hazard quotients are found along the central portion of the shoreline at Stations P-5 and WS9-34 including lead (HQ of 365), barium (270), chromium (55), and copper (119). These results were for both total and dissolved metals sample results.
- ***Cyanide*** – Cyanide levels exceeded screening criteria across the entire site but the highest exceedances appear to be concentrated in the central and western portions of

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the site. The highest level of cyanide was detected at Station GP-2-01 away from the shoreline, with an HQ of 848. The highest concentration of cyanide found in the nearshore area was found down-gradient of GP-2-01at Station WS8-59 (59 feet below ground surface [bgs]) with an HQ of 273.

- ***PAHs*** – Including benzo(a)anthracene, benzo(a)pyrene, benzo(b,k)fluoranthene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and occasionally, ideno(1,2,3-cd)pyrene and anthracene. With the highest HQs (in the 200 range) at Station P-3 (28 to 33 feet bgs) and lower HQs (0 to 30 range) at WS8-33, WS8-59, WS9-34,GP-2-02, GP-4, and GP-6. Exceedances were concentrated in the western half of the shoreline.
- ***Volatiles*** – Including 1,1-DCE, cis-1,2-DCE, and occasionally 1,2-DCB, 1,4-DCB, dibenzofuran, and TCE. Most of these exceedances were concentrated at the western portion of the shoreline and at the station GP-2-02, set back from the shoreline. Concentrations of cis-1,2-DCE were found to exceed criteria the most frequently and to the highest degree. HQs of cis-1,2-DCE ranged from 11 to 39 along the shoreline and higher levels were found upgradient at Station GP-2-02.
- ***BTEX*** – Benzene, toluene, ethylbenzene, and xylenes were found in concentrations that exceeded the ecological screening criteria in the central to northern portion of the site; however, these exceedances were not that frequent or high. Exceedances of benzene occurred at Stations GP-5, GP-6, and GP-2-02, all of which are superseded by monitoring points located closer to the shoreline, where no exceedances were identified. The highest concentrations of BTEX constituents were all found at Station GP-2-02, and the only exceedance of toluene was found at this location. Very few exceedances of BTEX constituents are found in the nearshore area and all of these HQs are less than 5. With specific regard to shoreline monitoring points, only ethylbenzene (three locations), and xylenes (two locations) were identified in groundwater at concentrations exceeding ecological surface water screening criteria. Specific exceedances were identified at the P-2 , P-3, and WS-8-33 locations for ethylbenzene (HQs from 4.1 to 5.6) and at the P-3 and WS-8-33 locations for xylenes (HQs from 1.7 to 4.1).

Human Health Groundwater

For human health criteria, chemicals of note include:

- *TCE* – TCE was detected on the western portion of the shoreline (Stations P-2, P-4, GP-2-02, GP-2-03, GP-5, GP-6, and GP-7) with one detection at an unusually high HQ of 19,167 at Station GP-2-02 (set back from the shoreline). In the nearshore area, the highest concentration of TCE was found at Station P-2 with a HQ of 373. These detections of TCE were generally in deeper samples (50 feet bgs or greater).
- *Arsenic* – Exceedances of arsenic were found in the eastern portion of the site at Stations P4, P5, P8 and P9. The highest HQ of 242 was detected at Station P5 at a depth of 96 to 100 feet bgs. Other exceedances of arsenic occurred at shallower depths.
- *PAHs* – Including benzo(a)anthracene, benzo(a)pyrene, benzo(b,k)fluoranthene, chrysene, and occasionally, indeno(1,2,3-cd)pyrene). With the highest HQs (in the 200 range) at P-3 (28 to 33 feet bgs) and lower HQs (5 to 200 range) at WS8-33, WS8-59, WS9-34, GP-2-02, GP-4, and GP-6.
- *BTEX* – With regard to BTEX constituents in groundwater, only benzene concentrations were found to exceed human health surface water screening criteria. At shoreline locations, exceedances for benzene were identified at variable depths at the P-2, P-3, GP-4, and WS-8-33 locations, all at the western portion of the shoreline. The greatest exceedance of screening criteria was identified at a depth of 96 to 100 feet bgs at the P-2 location, where an HQ of 2.3 was identified.
- *1,1-DCE* – Exceedances of 1,1-DCE were found at a few stations in the western portion of the site (Stations P-2, GP-2-02, GP-5, GP-6, and GP-7). The highest HQ was at Station GP-2-02 (53). HQs for 1,1-DCE at the stations near the shoreline were all around 10 and were relatively deep (between 74 and 100 feet bgs).
- *Vinyl Chloride* – Detected on the western portion of the shoreline (Stations P-2, GP-5, GP-6, and GP-7), with relatively low hazard quotients (between about 1 and 12). These detections of vinyl chloride were generally in deeper samples (91 feet bgs or greater).

Stormwater

There were only relatively low exceedances of dissolved zinc for ecological screening levels for stormwater. These exceedances occurred at both the Fab 2 Outfall and the Administration Building Outfall. The highest HQ was 2.6 at the Fab 2 location.

Soil Data

For soil exceedances in catch basins or below the Fab 2 outfall, chemicals of note include:

- *PAHs* – Almost all of the exceedances found in soils collected in the catch basins or at the Fab 2 stormwater outfall were PAHs (including benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene). The highest concentrations of PAHs were found in the soils at the Fab 2 outfall, with HQs ranging from 152 to 438.
- *Metals* – Some exceedances of metals (antimony, copper, zinc) were found in the soils. The highest concentrations were found at the Fab 2 outfall location with HQs all less than 10.

3.3 Groundwater Fate and Transport Issues

A number of chemicals were found in groundwater near the shoreline at levels exceeding screening levels. However, as discussed above, these screening levels are for surface water. The groundwater sampled is relatively close to the shoreline, but still has to travel some distance to the river before discharging. The primary questions are:

- Could these chemicals be readily transported from their measured locations to the riverbank or submerged sediments along the shoreline?
- Once at the shoreline, would these chemicals be expected to discharge at concentrations above these same screening levels?

There are two basic factors that determine the answer to these questions:

- What are the physical characteristics of the hydrogeologic flow path that the chemicals would have to take?
- What are the fate and transport properties of the chemicals themselves?

Each of these factors is discussed more below.

3.3.1 Physical Hydrogeology

The wells and probe sampling locations are shown in cross-sections in Figures 8 through 13. Generally, most of the relatively high exceedances of screening levels occur in the alluvial WBZ. Depending on the depths at which chemicals were detected, the distances within this WBZ to the river can vary considerably. For example, at Station P-2 (Figure 9) the lateral distance from the shallowest sampling interval (28 to 32 feet bgs) to the

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river is about 30 feet. Conversely, the lateral distance from the middle sampling interval (54 to 58 feet bgs) to the river is about 120 feet and the deepest sampling interval (96 to 100 feet bgs) is about 20 feet below the bottom of the river, so a lateral path would not intersect with the river.

Consequently, the flow path of any of these chemicals to the river would be determined by their location relative the sloping river bank as well as any vertical components of the groundwater flow. The groundwater flow velocity for the Sand Unit WBZ at the Gasco site has been reported (HAI 1998) in the 0.007 to 0.13 foot per day range. The flow is generally lateral with a slight upward direction noted in some data. This upward component is small enough that source evaluations at the Gasco site assumed the flow path was essentially lateral.

In addition, the permeability of the WBZ soil units where the chemicals are present is important to fate and transport. At the Gasco site, the estimated hydraulic conductivities were 4×10^{-4} cm/sec for the alluvial unit and 1×10^{-4} cm/sec for the fill unit. At Wacker, slug testing activities performed by HAI in February 2003 suggested conductivities for the Surficial Fill WBZ ranging from 2.3×10^{-4} to 5.4×10^{-4} cm/sec, and conductivities for the Alluvial Sand WBZ ranging from 9.7×10^{-5} to 1.4×10^{-4} cm/sec. For both these soil units this permeability was estimated to be associated with an overall soil porosity of about 0.3 (Anchor 2001).

3.3.2 Chemical Properties

Major factors affecting attenuation of chemicals in groundwater moving through soils are:

- Partitioning rate of the chemical to soil defined by a distribution coefficient, or K_d. For organics, K_d is primarily governed by the organic carbon partitioning coefficient or K_{oc} for the chemical
- Solubility of the chemical in water
- For organics, the degradation rates of chemical
- Henry's Law constant defines the partitioning between water and air and becomes more important as groundwater approaches the surface or surface water

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Approximate K_{oc}, solubility, degradation, and Henry's law constant values available for the chemicals passing through the screening process are shown in Table 9.

In general, lower K_d or K_{oc} values represent greater mobility of chemicals in soils. As Table 9 shows, the lowest K_d/K_{oc} values are for volatile organics and metals. Volatile organics also tend to have a high solubility in water, which contributes to higher mobility in groundwater. (The solubility of metals is generally complex and highly dependent on pH and oxidation/reduction potential of the system. Consequently, the solubility of the metals under site-specific conditions is more difficult to predict.) PAHs and phthalates tend to have much higher K_{oc} values and much lower solubilities indicating less mobility.

The degradation half-lives are generally lower for volatile organics (indicating degradation relatively quickly) and higher for PAHs. Elemental metals do not degrade.

3.3.3 Fate and Transport Estimates

The above physical and chemical characteristics can be used to simply estimate the travel times that would be expected for these chemicals from the locations observed in groundwater to the nearest shoreline. This can be accomplished by calculating the retardation factor (Reible 1998):

$$Rf = 1 + (Pb/\phi) * (K_d)$$

where:

ϕ = porosity of the soil (unitless; assumed 0.3)

K_d = Distribution coefficient for the chemical (L/kg; see Table 7).

SG = specific gravity of soils (kg/L; assumed 2.5)

Pb = $(1-\phi)*SG$

For organics K_d is given by $K_d = K_{oc} * f_{oc}$, where f_{oc} is the fraction organic carbon in the soils (assumed 0.005) (Reible 1998).

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Using Rf, the travel time is given by:

$$T = (Rf * L) / U$$

where:

L = distance from source to river (feet)

U = groundwater effective velocity (feet/day; assumed 0.13)

The distance from the source to the river was estimated using wells close to the shoreline that had relatively high hazard quotients for each chemical. If the measured point of the chemical was below the bottom of the river, it was assumed that the chemical would enter the river within the navigation channel.

This calculation provides an approximate estimate of the time it would take for the chemical to reach the shoreline at the concentration currently observed at the source (i.e., the location where the concentration was measured). This assumes that there is no attenuation of the chemical either through depletion of the source, diffusion/dispersion, or biodegradation. The resulting travel times from this calculation are shown in Table 10, and indicate that metals, cyanide, and chlorinated volatile organics would be of potential concern as sources to the river.

In addition, for organic chemicals, the likely concentration when the chemicals reach the shoreline can be approximated by factoring in the degradation rate as follows:

$$C_{(t)} = C_{(0)} * e^{-kt}$$

where:

C_o = the source concentration of the chemical

$C_{(t)}$ = the concentration of the chemical at time t

k = first order degradation constant for the chemical

t = the travel time from the source to the river

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The estimated exceedances (in terms of HQs) at the end of the travel time are shown in Table 10. Again, it can be seen that some of the metals (which do not degrade), cyanide, and chlorinated volatile organics show the greatest potential to be sources to the river. The PAHs and semi-volatile compounds would be expected to degrade to immeasurably low concentrations in the time it takes for them to reach the river, while benzene would be estimated to have an HQ of 0.8 at the point of discharge to the river sediments.

3.4 Stormwater Fate and Transport

Stormwater was measured at the outfalls, and consequently, would be expected to be the same as concentrations actually entering the river. Observations of only a couple low-level exceedances of zinc above water quality criteria were noted.

Also of note, zinc is a very common urban stormwater contaminant and is normally found throughout urban areas at concentrations similar to those identified at Wacker. In general, site concentrations of zinc (167 to 475 μg/L) are within the range normally expected from urban stormwater runoff. Typical concentrations of zinc in urban roof runoff range between 50 to 12,200 μg/L, and the national average concentration of zinc in urban runoff is 160 μg/L (WPT 2003).

3.5 Soil Fate and Transport

Soil data was collected from stormwater catch basins and from beneath the Fab 2 stormwater outfall. These soils could potentially erode and/or be transported in to the river as a result of stormwater runoff. Subsequent mixing, dispersion, and dilution would mean that levels of contaminants found within the soils would not be as concentrated once deposited as sediments in the river. Further, catch basins are designed to collect such soil and prevent it from entering the river. Therefore, comparison of these soil data to sediment data provides an extremely conservative screening approach. Soil exceedances, when compared to these criteria, may not be an indication that any chemical is a source of risk in the river.

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3.6 Exposure at Point of Compliance

The above discussion considers the changes in groundwater concentrations due to generally accepted attenuation processes that occur within soils. It should also be recognized that these chemicals would not necessarily enter the river at these concentrations due to processes that tend to occur in and near surface water bodies. For exposures occurring in the surface water, substantial dilution would be expected within the water column.

For exposures occurring in the porewater of nearshore sediments, dilution and volatilization of chemicals prior to groundwater exiting the sediments would be expected to some degree (Boudreau 1996 and DiToro 2001). Specifically, as groundwater approaches surface sediments, a diffusive gradient exists between the deeper sediment porewater and the overlying surface water, which (normally) has much lower concentrations of dissolved chemicals than contaminated porewater. In addition, volatilization to air, particularly for volatile organics, can be an important process for chemicals with high Henry's Law constants (Boyer et al. 1994), which tend to reduce concentrations within porewater as it approaches surface water. This process would be most notable in areas where the discharge is close to the river surface.

As discussed above, the point of compliance for soil migration to the river is in the river sediments. Contaminants found within stormwater catch basins and outfalls would most likely be deposited in the river at lower concentrations. Therefore, the data available are not directly comparable to levels that would be found at the point of compliance; however, these data are used in the screening process to provide a conservative approach.

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4 CONCLUSIONS

The primary goal of this preliminary report was to determine the likelihood that upland areas of the site might be a source of chemicals to the Willamette River at concentrations of potential concern. As noted above, this evaluation is preliminary in nature. Chemicals and/or areas that appear to be of potential concern after this evaluation are not confirmed sources to the river. Rather, the purpose of this evaluation is to define those chemicals and areas where further detailed analysis would be reasonable. This could include additional analysis of existing data, modeling using existing data, and/or additional data collection on the site and/or in the river to support further more detailed evaluations.

Surface water, groundwater, and applicable upland soil data were evaluated herein. This preliminary evaluation indicates that certain metals, cyanide, and chlorinated volatile organic chemicals in groundwater have the potential to be sources to the river. Based on the preliminary estimates of fate and transport for this site, the chemicals (and the locations of their peak concentrations) with the greatest potential as a source to the river, in priority order, are:

- TCE – particularly at Station P-2 at 100 feet bgs within the alluvial WBZ
- Metals – Arsenic, barium, and copper had the greatest HQs in groundwater, but chromium, cobalt, nickel, lead, selenium, vanadium, and zinc also had HQs greater than one. Although exceedances of metals-related screening levels were observed at the site, metals are relatively common elements in soils and water and can be found in some minerals at considerable concentrations. Further investigation of both the toxicity and expected background concentrations of metals may be worthwhile before confirming them as a source to the river.
- Cyanide - Because the fate and transport of this chemical can be complex, estimates concerning the potential for migration to the river did not consider degradation or attenuation. Further evaluation of the fate and transport properties of this chemical may be worthwhile.
- Vinyl Chloride – particularly at Station GP-7 (98 feet bgs)

Stormwater concentrations of dissolved zinc exceeded the screening criteria, but zinc is typically expected to be found in urban runoff. Typical concentrations of zinc in urban roof runoff range between 50 and 12,200 μg/L, and the national average concentration of zinc in urban runoff is 160 μg/L (WPT 2003). The two exceedances of zinc in stormwater that occurred

at the Wacker site were concentrations of 280 μg/L and 475 μg/L. These concentrations are within the range typically found in urban runoff but slightly above average. Additional evaluation with regard to discharge from on-site stormwater outfalls does not appear warranted.

Embankment soils and catch basin sediments contained chemicals concentrations greater than DEQ Level II SLVs for aquatic sediments. With regard to soils at the top of the embankment, no evidence of erosion into the river has been observed, and as such, further evaluation with regard to these soils do not appear warranted. With regard to catch basin soil/sediment, and as discussed above, the applicability of sediment screening levels to these soils is questionable.

Soils beneath the Fab 2 stormwater outfall were located midway down the river embankment in an area unprotected by rip-rap. Sampling of these soils identified chemical concentrations in excess of screening criteria. Further, the identified concentrations were similar to concentrations identified within subsurface soils (fill) at the adjacent P-6 boring location (HAI 2003). As such, it appears likely that the identified impacts immediately below the Fab 2 outfall are representative of exposed fill material at this location, and may not be related to historical discharges from the Fab 2 outfall. Based on the preceding, an evaluation of options regarding protective measures necessary to prevent the erosion of soils at this portion of the embankment appears warranted.

Based on the above conclusions the following further studies are recommended to understand the need for any source controls.

- Volatile Chemicals in Groundwater – It is recommended that further evaluation of TCE and vinyl chloride chemical transport to the river be conducted. Because these chemicals appear to be related to Wacker operations, such evaluation should be conducted by Wacker Siltronic Corporation.
- Metals in Groundwater – It is recommended that additional literature investigation be conducted on regional metals levels in groundwater and typical metals background concentrations in regional soils. If it is confirmed that metals exceedances appear to be higher than regional levels, further investigation of potential sources of those metals may be warranted.

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- Cyanide – As noted above, the fate and transport properties of this chemical are complex. We recommend that additional study of cyanide fate and transport processes be conducted to understand the potential for movement of this chemical to the river. Initially, this would focus on literature reviews of cyanide movement and modeling conducted at other sites in the country. Based on these findings more specific evaluations will be recommended.

Finally, although the importance of upland soils and catch basin sediments as a source to river sediments is unclear, an evaluation of options regarding protective measures necessary to prevent the erosion of soils on the embankment immediately beneath the Fab 2 stormwater outfall appears warranted. Further, it may be worthwhile to institute some best management practices that filter and remove catch basin sediments before they discharge from the site. Such measures may be more cost effective than continued study and evaluation of these upland soils and sediments as potential sources to the river.

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Tables

Table 1
Potential Water Quality Criteria (µg/L)

Chemical	USEPA 2002 AWQC Fresh Chronic Ecological (µg/L)	DEQ 2001 Level II SLVs Fresh Aquatic Ecological (µg/L)	USEPA 2002 AWQC Fish Ingest. Human (µg/L)	USEPA 2002 AWQC Fresh Acute Ecological (µg/L)
Antimony			640	
Arsenic	150	150	0.14	340
Barium		4		
Cadmium	0.09*	2.2		0.52*
Chromium	11	11		16
Cobalt		23		
Copper	2.74*	9		3.64*
Iron		1,000		
Lead	0.54*	2.5		13.88*
Magnesium		82,000		
Manganese		120		
Nickel	16.1*	52	4600	144.92*
Selenium	5	5	4200	
Silver		0.12		0.3*
Titanium				
Vanadium		20		
Zinc	36.5*	120	26000	36.2*
Amenable Cyanide	5.2	5.2	222000	22
Cyanide	5.2	5.2	222000	22
Chloride				
1,1-DCE		25	3.2	
1,2-DCB		14	17000	
1,3-DCB		71	960	
1,4-DCB		15	2600	
Benzene		130	51	
Chlorobenzene		50	21000	
cis-1,2-DCE		590		
Ethylbenzene		7.3	29000	
Naphthalene		620		
TCE		21,900	30	
Toluene		9.8	200000	
trans-1,2-DCE		590		
Vinyl Chloride			530	
Xylene		13		
2-Methylnaphthalene				
Acenaphthene		520	990	
Acenaphthylene				
Anthracene		13	40000	
Benzo (a) anthracene		0.027	0.018	
Benzo (a) pyrene		0.014	0.018	
Benzo (b) fluoranthene			0.018	
Benzo (g,h,i) perylene				
Benzo (k) fluoranthene			0.018	
Bis (2-chloroisopropyl)ether			65000	
Bis (2-ethyl hexyl) phthalate		3	2.2	
Butyl benzyl phthalate		19	1900	
Carbazole				
Chrysene			0.018	
Dibenzo (a,h) anthracene			0.018	
Dibenzofuran		3.7		

Table 1
Potential Water Quality Criteria (µg/L)

	USEPA 2002 AWQC Fresh Chronic Ecological	DEQ 2001 Level II SLVs Fresh Aquatic Ecological	USEPA 2002 AWQC Fish Ingest. Human	USEPA 2002 AWQC Fresh Acute Ecological
Diethyl phthalate		210	44000	
Fluoranthene		6.16	140	
Fluorene		3.9	5300	
Indeno (1,2,3-cd) pyrene			0.018	
Naphthalene		620		
Phenanthrene		6.3		
Pyrene			4000	

* Criterion expressed as a function of hardness. The value given here corresponds to a hardness of 25 mg/L, which is typical of the lower Willamette River (DEQ Water Quality Program). Criterion were calculated using the equation and parameters for calculating metals criteria that are hardness-dependent as found in Appendix B of USEPA's AWQC.

NOTE: For stormwater, the criteria that DEQ is currently using is 5 times the acute AWQC or 5 times the SLV if a AWQC is not available.

Table 2
Selected Ecological Screening Criteria

Parameter	Ground Water Screening Criteria (µg/L)	Source	Standard	Storm Water Screening Criteria (µg/L)	Source	Standard
Antimony	1600	DEQ 2001	Surface Water Aquatic	8000	USUSEPA 2002	Freshwater Acute (5x)
Arsenic	150	USEPA 2002	Freshwater Chronic	1700	USEPA 2002	Freshwater Acute (5x)
Barium	4	DEQ 2001	Surface Water Aquatic	20	DEQ 2001	Surface Water Aquatic (5x)
Cadmium	0.09*	USEPA 2002	Freshwater Chronic	2.6*	USEPA 2002	Freshwater Acute (5x)
Chromium	11	USEPA 2002	Freshwater Chronic	80	USEPA 2002	Freshwater Acute (5x)
Cobalt	23	DEQ 2001	Surface Water Aquatic	115	DEQ 2001	Surface Water Aquatic (5x)
Copper	2.74*	USEPA 2002	Freshwater Chronic	18.2*	USEPA 2002	Freshwater Acute (5x)
Cyanide	5.2	USEPA 2002	Freshwater Chronic	110	USEPA 2002	Freshwater Acute (5x)
Iron	1000	DEQ 2001	Surface Water Aquatic	5000	DEQ 2001	Surface Water Aquatic (5x)
Lead	0.54*	USEPA 2002	Freshwater Chronic	69.4*	USEPA 2002	Freshwater Acute (5x)
Magnesium	82000	DEQ 2001	Surface Water Aquatic	410000	DEQ 2001	Surface Water Aquatic (5x)
Manganese	120	DEQ 2001	Surface Water Aquatic	600	DEQ 2001	Surface Water Aquatic (5x)
Nickel	16.1*	USEPA 2002	Freshwater Chronic	724.6	USEPA 2002	Freshwater Acute (5x)
Selenium	5	USEPA 2002	Freshwater Chronic	25	USEPA 2002	Freshwater Acute (5x)
Silver	0.12	DEQ 2001	Surface Water Aquatic	1.5*	USEPA 2002	Freshwater Acute (5x)
Vanadium	20	DEQ 2001	Surface Water Aquatic	100	DEQ 2001	Surface Water Aquatic (5x)
Zinc	36.5*	USEPA 2002	Freshwater Chronic	181*	USEPA 2002	Freshwater Acute (5x)
Amenable Cyanide	5.2	USEPA 2002	Freshwater Chronic	110	USEPA 2002	Freshwater Acute (5x)
1,1-DCE	25	DEQ 2001	Surface Water Aquatic	125	DEQ 2001	Surface Water Aquatic (5x)
1,2-DCB	14	DEQ 2001	Surface Water Aquatic	70	DEQ 2001	Surface Water Aquatic (5x)
1,3-DCB	71	DEQ 2001	Surface Water Aquatic	355	DEQ 2001	Surface Water Aquatic (5x)
1,4-DCB	15	DEQ 2001	Surface Water Aquatic	75	DEQ 2001	Surface Water Aquatic (5x)
Benzene	130	DEQ 2001	Surface Water Aquatic	650	DEQ 2001	Surface Water Aquatic (5x)
Chlorobenzene	50	DEQ 2001	Surface Water Aquatic	250	DEQ 2001	Surface Water Aquatic (5x)
cis-1,2-DCE	590	DEQ 2001	Surface Water Aquatic	2950	DEQ 2001	Surface Water Aquatic (5x)
Ethylbenzene	7.3	DEQ 2001	Surface Water Aquatic	36.5	DEQ 2001	Surface Water Aquatic (5x)
Naphthalene	620	DEQ 2001	Surface Water Aquatic	3100	DEQ 2001	Surface Water Aquatic (5x)
TCE	21900	DEQ 2001	Surface Water Aquatic	109500	DEQ 2001	Surface Water Aquatic (5x)
Toluene	9.8	DEQ 2001	Surface Water Aquatic	49	DEQ 2001	Surface Water Aquatic (5x)
trans-1,2-DCE	590	DEQ 2001	Surface Water Aquatic	2950	DEQ 2001	Surface Water Aquatic (5x)
Xylene	13	DEQ 2001	Surface Water Aquatic	65	DEQ 2001	Surface Water Aquatic (5x)
Acenaphthene	520	DEQ 2001	Surface Water Aquatic	2600	DEQ 2001	Surface Water Aquatic (5x)
Anthracene	13	DEQ 2001	Surface Water Aquatic	65	DEQ 2001	Surface Water Aquatic (5x)
Benzo (a) anthracene	0.027	DEQ 2001	Surface Water Aquatic	0.135	DEQ 2001	Surface Water Aquatic (5x)

Table 2
Selected Ecological Screening Criteria

Parameter	Ground Water Screening Criteria (µg/L)	Source	Standard	Storm Water Screening Criteria (µg/L)	Source	Standard
Benzo (a) pyrene	0.014	DEQ 2001	Surface Water Aquatic	0.07	DEQ 2001	Surface Water Aquatic (5x)
Bis (2-ethyl hexyl) phthalate	3	DEQ 2001	Surface Water Aquatic	15	DEQ 2001	Surface Water Aquatic (5x)
Butyl benzyl phthalate	19	DEQ 2001	Surface Water Aquatic	95	DEQ 2001	Surface Water Aquatic (5x)
Dibenzofuran	3.7	DEQ 2001	Surface Water Aquatic	18.5	DEQ 2001	Surface Water Aquatic (5x)
Diethyl phthalate	210	DEQ 2001	Surface Water Aquatic	1050	DEQ 2001	Surface Water Aquatic (5x)
Fluoranthene	6.16	DEQ 2001	Surface Water Aquatic	30.8	DEQ 2001	Surface Water Aquatic (5x)
Fluorene	3.9	DEQ 2001	Surface Water Aquatic	19.5	DEQ 2001	Surface Water Aquatic (5x)
Phenanthrene	6.3	DEQ 2001	Surface Water Aquatic	31.5	DEQ 2001	Surface Water Aquatic (5x)

* Criterion expressed as a function of hardness. The value given here corresponds to a hardness of 25 mg/L, which is typical of the lower Willamette River (DEQ Water Quality Program). Criterion were calculated using the equation and parameters for calculating metals criteria that are hardness-dependent as found in Appendix B of

NOTE: For stormwater, the criteria that DEQ is currently using is 5 times the acute AWQC or 5 times the SLV if a AWQC is not available.

Table 3
Selected Human Health Sceening Criteria

Parameter	Ground Water Screening Criteria (µg/L)	Storm Water Screening Criteria* (µg/L)	Source	Standard
Antimony	640	3200	USEPA 2002	Consumption (organism)
Arsenic	0.14	0.7	USEPA 2002	Consumption (organism)
Nickel	4600	23000	USEPA 2002	Consumption (organism)
Selenium	4200	21000	USEPA 2002	Consumption (organism)
Zinc	26,000	130000	USEPA 2002	Consumption (organism)
Amenable Cyanide	222,000	1110000	USEPA 2002	Consumption (organism)
Cyanide	222,000	1110000	USEPA 2002	Consumption (organism)
1,1-DCE	3.2	16	USEPA 2002	Consumption (organism)
1,2-DCB	17,000	85000	USEPA 2002	Consumption (organism)
1,3-DCB	960	4800	USEPA 2002	Consumption (organism)
1,4-DCB	2,600	13000	USEPA 2002	Consumption (organism)
Benzene	51	255	USEPA 2002	Consumption (organism)
Chlorobenzene	21,000	105000	USEPA 2002	Consumption (organism)
Ethylbenzene	29,000	145000	USEPA 2002	Consumption (organism)
TCE	30	150	USEPA 2002	Consumption (organism)
Toluene	200,000	1000000	USEPA 2002	Consumption (organism)
trans-1,2-DCE	140,000	700000	USEPA 2002	Consumption (organism)
Vinyl Chloride	530	2650	USEPA 2002	Consumption (organism)
Acenaphthene	990	4950	USEPA 2002	Consumption (organism)
Anthracene	40,000	200000	USEPA 2002	Consumption (organism)
Benzo (a) anthracene	0.018	0.09	USEPA 2002	Consumption (organism)
Benzo (a) pyrene	0.018	0.09	USEPA 2002	Consumption (organism)
Benzo (b) fluoranthene	0.018	0.09	USEPA 2002	Consumption (organism)
Benzo (k) fluoranthene	0.018	0.09	USEPA 2002	Consumption (organism)
Bis (2-chloroisopropyl)ether	65000	325000	USEPA 2002	Consumption (organism)
Bis (2-ethyl hexyl) phthalate	2.2	11	USEPA 2002	Consumption (organism)
Butyl benzyl phthalate	1900	9500	USEPA 2002	Consumption (organism)
Chrysene	0.018	0.09	USEPA 2002	Consumption (organism)
Dibenzo (a,h) anthracene	0.018	0.09	USEPA 2002	Consumption (organism)
Diethyl phthalate	44000	220000	USEPA 2002	Consumption (organism)
Fluoranthene	140	700	USEPA 2002	Consumption (organism)
Fluorene	5300	26500	USEPA 2002	Consumption (organism)
Indeno (1,2,3-cd) pyrene	0.018	0.09	USEPA 2002	Consumption (organism)
Pyrene	4000	20000	USEPA 2002	Consumption (organism)

* Storm water criterion are calculated to be 5 times the AWQC consumption criterion.

Table 4
Selected Soil Screening Criteria

Parameter	Sediment Screening Criteria (µg/kg)	Source	Standard
Acenaphthene	290	DEQ 2001	Sediment Screening
Acenaphthylene	160	DEQ 2001	Sediment Screening
Anthracene	57	DEQ 2001	Sediment Screening
Antimony	3,000	DEQ 2001	Sediment Screening
Arsenic	6000	DEQ 2001	Sediment Screening
Benz (a) anthracene	32	DEQ 2001	Sediment Screening
Benzo (a) pyrene	32	DEQ 2001	Sediment Screening
Benzo (g,h,i) perylene	300	DEQ 2001	Sediment Screening
Benzo (k) fluoranthene	27	DEQ 2001	Sediment Screening
Cadmium	600	DEQ 2001	Sediment Screening
Carbazole	140	DEQ 2001	Sediment Screening
Chromium	37000	DEQ 2001	Sediment Screening
Chrysene	57	DEQ 2001	Sediment Screening
Copper	36000	DEQ 2001	Sediment Screening
Dibenzo (a,h) anthracene	33	DEQ 2001	Sediment Screening
Dibenzofuran	5100	DEQ 2001	Sediment Screening
Fluoranthene	111	DEQ 2001	Sediment Screening
Fluorene	77	DEQ 2001	Sediment Screening
Indeno (1,2,3-cd) pyrene	17	DEQ 2001	Sediment Screening
Lead	35000	DEQ 2001	Sediment Screening
Manganese	1100000	DEQ 2001	Sediment Screening
Naphthalene	176	DEQ 2001	Sediment Screening
Nickel	18000	DEQ 2001	Sediment Screening
Phenanthrene	42	DEQ 2001	Sediment Screening
Pyrene	53	DEQ 2001	Sediment Screening
Silver	4500	DEQ 2001	Sediment Screening
Zinc	123000	DEQ 2001	Sediment Screening

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
GP02-01		Cyanide	32-36	4410	5.2	848.1
GP-02-02		1,1-DCE	94-98	171	25	6.8
GP-02-02		Anthracene	21-25	20.7	13	1.6
GP-02-02		Benzene	21-25	4970	130	38.2
GP-02-02		Benzene	54-58	1060	130	8.2
GP-02-02		Benzo (a) anthracene	21-25	2.71	0.027	100.4
GP-02-02		Benzo (a) pyrene	21-25	2.48	0.014	177.1
GP-02-02		cis-1,2-DCE	21-25	21500	590	36.4
GP-02-02		cis-1,2-DCE	54-58	57900	590	98.1
GP-02-02		Cyanide	21-25	4040	5.2	776.9
GP-02-02		Cyanide	54-58	1010	5.2	194.2
GP-02-02		Ethylbenzene	94-98	47.8	7.3	6.5
GP-02-02		Fluoranthene	21-25	17.6	6.16	2.9
GP-02-02		Fluorene	21-25	74.2	3.9	19
GP-02-02		Naphthalene	21-25	9200	620	14.8
GP-02-02		Naphthalene	54-58	1030	620	1.7
GP-02-02		Naphthalene	54-58	2160	620	3.5
GP-02-02		Phenanthrene	21-25	139	6.3	22.1
GP-02-02		TCE	94-98	575000	21900	26.3
GP-02-02		Toluene	94-98	43.1	9.8	4.4
GP-02-02	Total	Xylene	94-98	31.4	13	2.4
GP-02-03		Cyanide	29-33	276	5.2	53.1
GP-02-03		Cyanide	54-58	498	5.2	95.8
GP-02-03		Cyanide	94-98	309	5.2	59.4
GP-4		Benzo (a) anthracene	64-68	0.03	0.027	1.1
GP-4		Benzo (a) pyrene	64-68	0.032	0.014	2.3
GP-4		Cyanide	64-68	840	5.2	161.5
GP-4		Cyanide	94-98	910	5.2	175
GP-5		1,1-DCE	91-95	36	25	1.4
GP-5		Benzene	91-95	210	130	1.6
GP-5		cis-1,2-DCE	91-95	12000	590	20.3
GP-5		Cyanide	64-68	630	5.2	121.2
GP-5		Cyanide	91-95	810	5.2	155.8
GP-6		1,1-DCE	94-98	36	25	1.4
GP-6		1,1-DCE	94-98	39	25	1.6
GP-6		Benzene	94-98	200	130	1.5
GP-6		Benzene	94-98	220	130	1.7
GP-6		Benzo (a) anthracene	70-74	0.07	0.027	2.6
GP-6		Benzo (a) anthracene	94-98	0.17	0.027	6.3
GP-6		Benzo (a) anthracene	94-98	0.22	0.027	8.1
GP-6		Benzo (a) pyrene	70-74	0.073	0.014	5.2
GP-6		Benzo (a) pyrene	94-98	0.16	0.014	11.4
GP-6		Benzo (a) pyrene	94-98	0.2	0.014	14.3
GP-6		cis-1,2-DCE	94-98	16000	590	27.1
GP-6		Cyanide	70-74	620	5.2	119.2
GP-6		Cyanide	94-98	650	5.2	125
GP-6		Cyanide	94-98	700	5.2	134.6
GP-7		1,1-DCE	94-98	36	25	1.4
GP-7		cis-1,2-DCE	74-78	6900	590	11.7

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
GP-7		cis-1,2-DCE	94-98	23000	590	39
GP-7		Cyanide	74-78	630	5.2	121.2
GP-7		Cyanide	94-98	640	5.2	123.1
P-1A		Amenable Cyanide	54-58	64	5.2	12.3
P-1A		Cyanide	24-28	59	5.2	11.3
P-1A		Cyanide	54-58	642	5.2	123.5
P-1A	Dissolved	Barium	24-28	50.4	4	12.6
P-1A	Dissolved	Barium	54-58	65.7	4	16.4
P-1A	Dissolved	Iron	24-28	6960	1000	7
P-1A	Dissolved	Iron	54-58	32500	1000	32.5
P-1A	Dissolved	Manganese	24-28	1330	120	11.1
P-1A	Dissolved	Manganese	54-58	1890	120	15.8
P-1A	Dissolved	Nickel	24-28	39	16.1	2.4
P-1A	Dissolved	Nickel	54-58	35.3	16.1	2.2
P-1A	Dissolved	Zinc	24-28	151	36.5	4.1
P-1A	Dissolved	Zinc	54-58	60.2	36.5	1.6
P-2		cis-1,2-DCE	96-100	6780	590	11.5
P-2		Cyanide	28-32	723	5.2	139
P-2		Cyanide	54-58	255	5.2	49
P-2		Cyanide	96-100	549	5.2	105.6
P-2		Ethylbenzene	96-100	41	7.3	5.6
P-2		Fluorene	54-58	16.4	3.9	4.2
P-2		Phenanthrene	54-58	12	6.3	1.9
P-2		Phenanthrene	96-100	20	6.3	3.2
P-2	Dissolved	Barium	28-32	121	4	30.2
P-2	Dissolved	Barium	54-58	50.1	4	12.5
P-2	Dissolved	Barium	96-100	151	4	37.8
P-2	Dissolved	Chromium	96-100	22.4	11	2
P-2	Dissolved	Copper	96-100	13.3	2.74	4.9
P-2	Dissolved	Iron	28-32	99500	1000	99.5
P-2	Dissolved	Iron	54-58	26500	1000	26.5
P-2	Dissolved	Iron	96-100	71500	1000	71.5
P-2	Dissolved	Manganese	28-32	3630	120	30.2
P-2	Dissolved	Manganese	54-58	331	120	2.8
P-2	Dissolved	Manganese	96-100	4470	120	37.2
P-2	Dissolved	Nickel	28-32	18.5	16.1	1.1
P-2	Dissolved	Nickel	96-100	39.1	16.1	2.4
P-2	Dissolved	Vanadium	96-100	37.3	20	1.9
P-2	Dissolved	Zinc	28-32	72.1	36.5	2
P-2	Dissolved	Zinc	96-100	151	36.5	4.1
P-3		Anthracene	28.5-32.5	19.1	13	1.5
P-3		Benzo (a) anthracene	28.5-32.5	4.2	0.027	155.6
P-3		Benzo (a) pyrene	28.5-32.5	4.23	0.014	302.1
P-3		Bis (2-ethyl hexyl) phthalate	96-100	5.57	3	1.9
P-3		Cyanide	28.5-32.5	650	5.2	125
P-3		Cyanide	55-59	450	5.2	86.5
P-3		Cyanide	96-100	498	5.2	95.8
P-3		Dibenzofuran	28.5-32.5	6.29	3.7	1.7
P-3		Ethylbenzene	28.5-32.5	29.9	7.3	4.1

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
P-3		Fluoranthene	28.5-32.5	26.8	6.16	4.4
P-3		Fluorene	28.5-32.5	43	3.9	11
P-3		Fluorene	96-100	3.95	3.9	1
P-3		Naphthalene	28.5-32.5	933	620	1.5
P-3		Phenanthrene	28.5-32.5	88.3	6.3	14
P-3		Phenanthrene	55-59	8.69	6.3	1.4
P-3		Phenanthrene	96-100	22.8	6.3	3.6
P-3	Dissolved	Barium	28.5-32.5	172	4	43
P-3	Dissolved	Barium	55-59	126	4	31.5
P-3	Dissolved	Barium	96-100	101	4	25.2
P-3	Dissolved	Iron	28.5-32.5	100000	1000	100
P-3	Dissolved	Iron	55-59	40400	1000	40.4
P-3	Dissolved	Iron	96-100	46500	1000	46.5
P-3	Dissolved	Manganese	28.5-32.5	5060	120	42.2
P-3	Dissolved	Manganese	55-59	771	120	6.4
P-3	Dissolved	Manganese	96-100	2060	120	17.2
P-3	Dissolved	Nickel	55-59	30.3	16.1	1.9
P-3	Dissolved	Nickel	96-100	38.6	16.1	2.4
P-3	Dissolved	Zinc	55-59	77.6	36.5	2.1
P-3	Dissolved	Zinc	96-100	173	36.5	4.7
P-3	Total	Xylene	28.5-32.5	22.3	13	1.7
P-4		Cyanide	28-32	56	5.2	10.8
P-4		Cyanide	50-54	71	5.2	13.7
P-4		Fluoranthene	28-32	8.16	6.16	1.3
P-4		Fluorene	28-32	11.9	3.9	3.1
P-4		Phenanthrene	28-32	24.6	6.3	3.9
P-4	Dissolved	Barium	28-32	149	4	37.2
P-4	Dissolved	Barium	50-54	105	4	26.2
P-4	Dissolved	Iron	28-32	87500	1000	87.5
P-4	Dissolved	Iron	50-54	47300	1000	47.3
P-4	Dissolved	Manganese	28-32	6350	120	52.9
P-4	Dissolved	Manganese	50-54	1280	120	10.7
P-4	Dissolved	Nickel	50-54	36.6	16.1	2.3
P-4	Dissolved	Zinc	50-54	89.6	36.5	2.5
P-5		Cyanide	52-56	139	5.2	26.7
P-5		Cyanide	96-100	660	5.2	126.9
P-5		Phenanthrene	29-33	7.56	6.3	1.2
P-5		Phenanthrene	29-33	8.16	6.3	1.3
P-5		Phenanthrene	96-100	14.5	6.3	2.3
P-5	Dissolved	Barium	29-33	202	4	50.5
P-5	Dissolved	Barium	29-33	245	4	61.2
P-5	Dissolved	Barium	52-56	352	4	88
P-5	Dissolved	Barium	96-100	1080	4	270
P-5	Dissolved	Chromium	52-56	129	11	11.7
P-5	Dissolved	Chromium	96-100	610	11	55.5
P-5	Dissolved	Cobalt	52-56	46	23	2
P-5	Dissolved	Cobalt	96-100	134	23	5.8
P-5	Dissolved	Copper	29-33	10.4	2.74	3.8
P-5	Dissolved	Copper	52-56	89.4	2.74	32.6

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
P-5	Dissolved	Copper	96-100	327	2.74	119.3
P-5	Dissolved	Iron	29-33	86000	1000	86
P-5	Dissolved	Iron	29-33	100000	1000	100
P-5	Dissolved	Iron	52-56	92700	1000	92.7
P-5	Dissolved	Iron	96-100	457000	1000	457
P-5	Dissolved	Lead	29-33	19.3	0.54	35.7
P-5	Dissolved	Lead	52-56	8.3	0.54	15.4
P-5	Dissolved	Lead	96-100	35.9	0.54	66.5
P-5	Dissolved	Magnesium	52-56	82500	82000	1
P-5	Dissolved	Magnesium	96-100	132000	82000	1.6
P-5	Dissolved	Manganese	29-33	5520	120	46
P-5	Dissolved	Manganese	29-33	6110	120	50.9
P-5	Dissolved	Manganese	52-56	1570	120	13.1
P-5	Dissolved	Manganese	96-100	9980	120	83.2
P-5	Dissolved	Nickel	29-33	19.4	16.1	1.2
P-5	Dissolved	Nickel	29-33	47.2	16.1	2.9
P-5	Dissolved	Nickel	52-56	102	16.1	6.3
P-5	Dissolved	Nickel	96-100	351	16.1	21.8
P-5	Dissolved	Vanadium	52-56	204	20	10.2
P-5	Dissolved	Vanadium	96-100	635	20	31.8
P-5	Dissolved	Zinc	52-56	333	36.5	9.1
P-5	Dissolved	Zinc	96-100	1690	36.5	46.3
P-6		Cyanide	46-50	37	5.2	7.1
P-6	Dissolved	Barium	32-36	55.7	4	13.9
P-6	Dissolved	Barium	46-50	101	4	25.2
P-6	Dissolved	Iron	32-36	3290	1000	3.3
P-6	Dissolved	Iron	46-50	19500	1000	19.5
P-6	Dissolved	Manganese	32-36	1920	120	16
P-6	Dissolved	Manganese	46-50	715	120	6
P-6	Dissolved	Nickel	46-50	31.3	16.1	1.9
P-6	Dissolved	Selenium	46-50	5.1	5	1
P-6	Dissolved	Zinc	46-50	230	36.5	6.3
P-7	Dissolved	Barium	56-62	229	4	57.2
P-7	Dissolved	Iron	56-62	45200	1000	45.2
P-7	Dissolved	Manganese	56-62	6440	120	53.7
P-7	Dissolved	Nickel	56-62	29.9	16.1	1.9
P-7	Dissolved	Selenium	56-62	5.6	5	1.1
P-7	Dissolved	Zinc	56-62	91.7	36.5	2.5
P-8		1,2-DCB	80-84	31.1	14	2.2
P-8		1,2-DCB	80-84	425	14	30.4
P-8		1,4-DCB	80-84	155	15	10.3
P-8		Chlorobenzene	80-84	199	50	4
P-8		Cyanide	28-32	120	5.2	23.1
P-8		Cyanide	50-54	180	5.2	34.6
P-8		Phenanthrene	28-32	8.5	6.3	1.3
P-8	Dissolved	Barium	28-32	138	4	34.5
P-8	Dissolved	Barium	50-54	108	4	27
P-8	Dissolved	Barium	80-84	312	4	78
P-8	Dissolved	Copper	80-84	5.4	2.74	2

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
P-8	Dissolved	Iron	28-32	35200	1000	35.2
P-8	Dissolved	Iron	50-54	6170	1000	6.2
P-8	Dissolved	Iron	80-84	43500	1000	43.5
P-8	Dissolved	Magnesium	80-84	152000	82000	1.9
P-8	Dissolved	Manganese	28-32	6540	120	54.5
P-8	Dissolved	Manganese	50-54	542	120	4.5
P-8	Dissolved	Manganese	80-84	28900	120	240.8
P-8	Dissolved	Nickel	50-54	21.9	16.1	1.4
P-8	Dissolved	Nickel	80-84	60.6	16.1	3.8
P-8	Dissolved	Selenium	28-32	5.5	5	1.1
P-8	Dissolved	Selenium	80-84	16.1	5	3.2
P-8	Dissolved	Zinc	50-54	136	36.5	3.7
P-8	Dissolved	Zinc	80-84	307	36.5	8.4
P-9		Butyl benzyl phthalate	31-35	22.2	19	1.2
P-9		Cyanide	31-35	34	5.2	6.5
P-9	Dissolved	Barium	31-35	88	4	22
P-9	Dissolved	Iron	31-35	13400	1000	13.4
P-9	Dissolved	Manganese	31-35	14500	120	120.8
P-9	Dissolved	Selenium	31-35	6.4	5	1.3
WS-8-33		Benzo (a) anthracene	23-33	0.25	0.027	9.3
WS-8-33		Benzo (a) anthracene	23-33	0.31	0.027	11.5
WS-8-33		Benzo (a) anthracene	23-33	0.32	0.027	11.9
WS-8-33		Benzo (a) anthracene	23-33	0.53	0.027	19.6
WS-8-33		Benzo (a) anthracene	23-33	0.55	0.027	20.4
WS-8-33		Benzo (a) anthracene	23-33	0.68	0.027	25.2
WS-8-33		Benzo (a) pyrene	23-33	0.15	0.014	10.7
WS-8-33		Benzo (a) pyrene	23-33	0.26	0.014	18.6
WS-8-33		Benzo (a) pyrene	23-33	0.27	0.014	19.3
WS-8-33		Cyanide	23-33	416	5.2	80
WS-8-33		Cyanide	23-33	615	5.2	118.3
WS-8-33		Cyanide	23-33	724	5.2	139.2
WS-8-33		Cyanide	23-33	726	5.2	139.6
WS-8-33		Cyanide	23-33	854	5.2	164.2
WS-8-33		Dibenzofuran	23-33	3.97	3.7	1.1
WS-8-33		Dibenzofuran	23-33	4.26	3.7	1.2
WS-8-33		Ethylbenzene	23-33	18	7.3	2.5
WS-8-33		Ethylbenzene	23-33	19.5	7.3	2.7
WS-8-33		Ethylbenzene	23-33	27.9	7.3	3.8
WS-8-33		Ethylbenzene	23-33	29.6	7.3	4.1
WS-8-33		Ethylbenzene	23-33	30.4	7.3	4.2
WS-8-33		Ethylbenzene	23-33	31.6	7.3	4.3
WS-8-33		Fluoranthene	23-33	7.18	6.16	1.2
WS-8-33		Fluoranthene	23-33	7.35	6.16	1.2
WS-8-33		Fluoranthene	23-33	7.7	6.16	1.2
WS-8-33		Fluoranthene	23-33	7.83	6.16	1.3
WS-8-33		Fluoranthene	23-33	8.15	6.16	1.3
WS-8-33		Fluoranthene	23-33	8.2	6.16	1.3
WS-8-33		Fluorene	23-33	18.4	3.9	4.7
WS-8-33		Fluorene	23-33	19.5	3.9	5

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
WS-8-33		Fluorene	23-33	32.5	3.9	8.3
WS-8-33		Fluorene	23-33	34.4	3.9	8.8
WS-8-33		Fluorene	23-33	36.2	3.9	9.3
WS-8-33		Naphthalene	23-33	841	620	1.4
WS-8-33		Phenanthrene	23-33	33.8	6.3	5.4
WS-8-33		Phenanthrene	23-33	34.1	6.3	5.4
WS-8-33		Phenanthrene	23-33	72	6.3	11.4
WS-8-33		Phenanthrene	23-33	80.4	6.3	12.8
WS-8-33		Phenanthrene	23-33	85	6.3	13.5
WS-8-33		Xylene	23-33	18.5	13	1.4
WS-8-33		Xylene	23-33	20.48	13	1.6
WS-8-33		Xylene	23-33	23.2	13	1.8
WS-8-33		Xylene	23-33	49.8	13	3.8
WS-8-33		Xylene	23-33	53.1	13	4.1
WS-8-33	Dissolved	Barium	23-33	104	4	26
WS-8-33	Dissolved	Barium	23-33	114	4	28.5
WS-8-33	Dissolved	Iron	23-33	80700	1000	80.7
WS-8-33	Dissolved	Iron	23-33	81500	1000	81.5
WS-8-33	Dissolved	Manganese	23-33	4510	120	37.6
WS-8-33	Dissolved	Manganese	23-33	4890	120	40.8
WS-8-33	Dissolved	Manganese	23-33	5020	120	41.8
WS-8-33	Dissolved	Selenium	23-33	8.4	5	1.7
WS-8-33	Total	Barium	23-33	114	4	28.5
WS-8-33	Total	Barium	23-33	115	4	28.8
WS-8-33	Total	Barium	23-33	116	4	29
WS-8-33	Total	Barium	23-33	117	4	29.2
WS-8-33	Total	Barium	23-33	142	4	35.5
WS-8-33	Total	Barium	23-33	184	4	46
WS-8-33	Total	Copper	23-33	5	2.74	1.8
WS-8-33	Total	Copper	23-33	26.4	2.74	9.6
WS-8-33	Total	Iron	23-33	76600	1000	76.6
WS-8-33	Total	Iron	23-33	80300	1000	80.3
WS-8-33	Total	Iron	23-33	80600	1000	80.6
WS-8-33	Total	Iron	23-33	89600	1000	89.6
WS-8-33	Total	Iron	23-33	90900	1000	90.9
WS-8-33	Total	Iron	23-33	117000	1000	117
WS-8-33	Total	Lead	23-33	8.2	0.54	15.2
WS-8-33	Total	Manganese	23-33	4850	120	40.4
WS-8-33	Total	Manganese	23-33	4880	120	40.7
WS-8-33	Total	Manganese	23-33	4890	120	40.8
WS-8-33	Total	Manganese	23-33	5070	120	42.2
WS-8-33	Total	Manganese	23-33	5570	120	46.4
WS-8-33	Total	Selenium	23-33	6.3	5	1.3
WS-8-33	Total	Vanadium	23-33	39.7	20	2
WS-8-33	Total	Zinc	23-33	49.6	36.5	1.4
WS-8-59		Amenable Cyanide	49-59	263	5.2	50.6
WS-8-59		Benzo (a) anthracene	49-59	0.16	0.027	5.9
WS-8-59		Benzo (a) anthracene	49-59	0.17	0.027	6.3
WS-8-59		Benzo (a) anthracene	49-59	0.2	0.027	7.4

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
WS-8-59		Benzo (a) anthracene	49-59	0.23	0.027	8.5
WS-8-59		Benzo (a) anthracene	49-59	0.25	0.027	9.3
WS-8-59		Benzo (a) anthracene	49-59	0.32	0.027	11.9
WS-8-59		Benzo (a) pyrene	49-59	0.14	0.014	10
WS-8-59		Cyanide	49-59	456	5.2	87.7
WS-8-59		Cyanide	49-59	459	5.2	88.3
WS-8-59		Cyanide	49-59	468	5.2	90
WS-8-59		Cyanide	49-59	1420	5.2	273.1
WS-8-59		Fluorene	49-59	4.77	3.9	1.2
WS-8-59		Fluorene	49-59	5.13	3.9	1.3
WS-8-59		Fluorene	49-59	7.9	3.9	2
WS-8-59		Phenanthrene	49-59	9.9	6.3	1.6
WS-8-59		Phenanthrene	49-59	21.8	6.3	3.5
WS-8-59		Phenanthrene	49-59	22.8	6.3	3.6
WS-8-59		Phenanthrene	49-59	29.8	6.3	4.7
WS-8-59		Phenanthrene	49-59	31.8	6.3	5
WS-8-59	Total	Barium	49-59	93.1	4	23.3
WS-8-59	Total	Barium	49-59	100	4	25
WS-8-59	Total	Barium	49-59	119	4	29.8
WS-8-59	Total	Barium	49-59	123	4	30.8
WS-8-59	Total	Barium	49-59	142	4	35.5
WS-8-59	Total	Barium	49-59	153	4	38.2
WS-8-59	Total	Copper	49-59	3.7	2.74	1.4
WS-8-59	Total	Copper	49-59	5.5	2.74	2
WS-8-59	Total	Iron	49-59	45700	1000	45.7
WS-8-59	Total	Iron	49-59	46800	1000	46.8
WS-8-59	Total	Iron	49-59	47000	1000	47
WS-8-59	Total	Iron	49-59	47200	1000	47.2
WS-8-59	Total	Iron	49-59	48100	1000	48.1
WS-8-59	Total	Iron	49-59	49600	1000	49.6
WS-8-59	Total	Manganese	49-59	1830	120	15.2
WS-8-59	Total	Manganese	49-59	2190	120	18.2
WS-8-59	Total	Manganese	49-59	2840	120	23.7
WS-8-59	Total	Manganese	49-59	2850	120	23.8
WS-8-59	Total	Manganese	49-59	3330	120	27.8
WS-8-59	Total	Vanadium	49-59	23.3	20	1.2
WS-9-34		Benzo (a) anthracene	24-34	0.11	0.027	4.1
WS-9-34		Benzo (a) pyrene	24-34	0.15	0.014	10.7
WS-9-34		Cyanide	24-34	74	5.2	14.2
WS-9-34		Cyanide	24-34	110	5.2	21.2
WS-9-34		Cyanide	24-34	140	5.2	26.9
WS-9-34		Fluorene	24-34	6.43	3.9	1.6
WS-9-34	Dissolved	Barium	24-34	34.8	4	8.7
WS-9-34	Dissolved	Barium	24-34	46.7	4	11.7
WS-9-34	Dissolved	Barium	24-34	81	4	20.2
WS-9-34	Dissolved	Cobalt	24-34	23.1	23	1
WS-9-34	Dissolved	Iron	24-34	37700	1000	37.7
WS-9-34	Dissolved	Iron	24-34	64300	1000	64.3
WS-9-34	Dissolved	Iron	24-34	88000	1000	88

Table 5
Groundwater Results Exceeding Ecological Screening Values

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
WS-9-34	Dissolved	Manganese	24-34	2240	120	18.7
WS-9-34	Dissolved	Manganese	24-34	2590	120	21.6
WS-9-34	Dissolved	Manganese	24-34	4730	120	39.4
WS-9-34	Dissolved	Selenium	24-34	5.4	5	1.1
WS-9-34	Total	Barium	24-34	246	4	61.5
WS-9-34	Total	Barium	24-34	553	4	138.2
WS-9-34	Total	Barium	24-34	607	4	151.8
WS-9-34	Total	Barium	24-34	923	4	230.8
WS-9-34	Total	Chromium	24-34	18.7	11	1.7
WS-9-34	Total	Chromium	24-34	20.7	11	1.9
WS-9-34	Total	Chromium	24-34	32.6	11	3
WS-9-34	Total	Cobalt	24-34	27.3	23	1.2
WS-9-34	Total	Cobalt	24-34	28.1	23	1.2
WS-9-34	Total	Cobalt	24-34	40.4	23	1.8
WS-9-34	Total	Cobalt	24-34	43.7	23	1.9
WS-9-34	Total	Copper	24-34	7.4	2.74	2.7
WS-9-34	Total	Copper	24-34	35.9	2.74	13.1
WS-9-34	Total	Copper	24-34	39.1	2.74	14.3
WS-9-34	Total	Copper	24-34	43.1	2.74	15.7
WS-9-34	Total	Iron	24-34	33900	1000	33.9
WS-9-34	Total	Iron	24-34	146000	1000	146
WS-9-34	Total	Iron	24-34	150000	1000	150
WS-9-34	Total	Iron	24-34	188000	1000	188
WS-9-34	Total	Lead	24-34	94.8	0.54	175.6
WS-9-34	Total	Lead	24-34	131	0.54	242.6
WS-9-34	Total	Lead	24-34	197	0.54	364.8
WS-9-34	Total	Manganese	24-34	4310	120	35.9
WS-9-34	Total	Manganese	24-34	4350	120	36.2
WS-9-34	Total	Manganese	24-34	6660	120	55.5
WS-9-34	Total	Manganese	24-34	7100	120	59.2
WS-9-34	Total	Nickel	24-34	36.5	16.1	2.3
WS-9-34	Total	Nickel	24-34	36.9	16.1	2.3
WS-9-34	Total	Vanadium	24-34	43	20	2.2
WS-9-34	Total	Vanadium	24-34	48.2	20	2.4
WS-9-34	Total	Vanadium	24-34	54.8	20	2.7
WS-9-34	Total	Zinc	24-34	197	36.5	5.4
WS-9-34	Total	Zinc	24-34	224	36.5	6.1
WS-9-34	Total	Zinc	24-34	376	36.5	10.3

Table 6
Groundwater Results Exceeding Human Health Screening Criteria

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
GP-02-02		1,1-DCE	94-98	171	3.2	53.4
GP-02-02		Benzene	21-25	4970	51	97.5
GP-02-02		Benzene	54-58	1060	51	20.8
GP-02-02		Benzene	94-98	122	51	2.4
GP-02-02		Benzo (a) anthracene	21-25	2.71	0.018	150.6
GP-02-02		Benzo (a) pyrene	21-25	2.48	0.018	137.8
GP-02-02		Chrysene	21-25	3.63	0.018	201.7
GP-02-02		TCE	54-58	21100	30	703.3
GP-02-02		TCE	94-98	575000	30	19166.7
GP-02-03		TCE	54-58	33.4	30	1.1
GP-4		Benzene	94-98	87	51	1.7
GP-4		Benzo (a) anthracene	64-68	0.03	0.018	1.7
GP-4		Benzo (a) pyrene	64-68	0.032	0.018	1.8
GP-4		Benzo (b) fluoranthene	64-68	0.024	0.018	1.3
GP-4		Chrysene	64-68	0.034	0.018	1.9
GP-4		Indeno (1,2,3-cd) pyrene	64-68	0.23	0.018	12.8
GP-5		1,1-DCE	91-95	36	3.2	11.2
GP-5		Benzene	91-95	210	51	4.1
GP-5		TCE	91-95	12000	30	400
GP-5		Vinyl Chloride	91-95	2000	530	3.8
GP-6		1,1-DCE	94-98	36	3.2	11.2
GP-6		1,1-DCE	94-98	39	3.2	12.2
GP-6		Benzene	94-98	200	51	3.9
GP-6		Benzene	94-98	220	51	4.3
GP-6		Benzo (a) anthracene	70-74	0.07	0.018	3.9
GP-6		Benzo (a) anthracene	94-98	0.17	0.018	9.4
GP-6		Benzo (a) anthracene	94-98	0.22	0.018	12.2
GP-6		Benzo (a) pyrene	70-74	0.073	0.018	4.1
GP-6		Benzo (a) pyrene	94-98	0.16	0.018	8.9
GP-6		Benzo (a) pyrene	94-98	0.2	0.018	11.1
GP-6		Benzo (b) fluoranthene	70-74	0.047	0.018	2.6
GP-6		Benzo (b) fluoranthene	94-98	0.094	0.018	5.2
GP-6		Benzo (b) fluoranthene	94-98	0.13	0.018	7.2
GP-6		Benzo (k) fluoranthene	70-74	0.051	0.018	2.8
GP-6		Benzo (k) fluoranthene	94-98	0.089	0.018	4.9
GP-6		Benzo (k) fluoranthene	94-98	0.12	0.018	6.7
GP-6		Chrysene	70-74	0.08	0.018	4.4
GP-6		Chrysene	94-98	0.2	0.018	11.1
GP-6		Chrysene	94-98	0.26	0.018	14.4
GP-6		Indeno (1,2,3-cd) pyrene	70-74	0.044	0.018	2.4
GP-6		Indeno (1,2,3-cd) pyrene	94-98	0.1	0.018	5.6
GP-6		Indeno (1,2,3-cd) pyrene	94-98	0.11	0.018	6.1
GP-6		TCE	70-74	360	30	12
GP-6		TCE	94-98	2400	30	80
GP-6		TCE	94-98	2500	30	83.3
GP-6		Vinyl Chloride	94-98	2600	530	4.9
GP-6		Vinyl Chloride	94-98	2700	530	5.1
GP-7		1,1-DCE	74-78	23	3.2	7.2
GP-7		1,1-DCE	94-98	36	3.2	11.2

Table 6
Groundwater Results Exceeding Human Health Screening Criteria

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
GP-7		Chrysene	74-78	0.023	0.018	1.3
GP-7		TCE	74-78	1000	30	33.3
GP-7		TCE	94-98	250	30	8.3
GP-7		Vinyl Chloride	94-98	6300	530	11.9
P-2		1,1-DCE	96-100	12.6	3.2	3.9
P-2		Benzene	28-32	61.2	51	1.2
P-2		Benzene	96-100	117	51	2.3
P-2		TCE	96-100	11200	30	373.3
P-2		Vinyl Chloride	96-100	720	530	1.4
P-2	Dissolved	Arsenic	28-32	24.3	0.14	173.6
P-3		Benzene	28.5-32.5	104	51	2
P-3		Benzo (a) anthracene	28.5-32.5	4.2	0.018	233.3
P-3		Benzo (a) pyrene	28.5-32.5	4.23	0.018	235
P-3		Benzo (b) fluoranthene	28.5-32.5	2.12	0.018	117.8
P-3		Bis (2-ethyl hexyl) phthalate	96-100	5.57	2.2	2.5
P-3		Chrysene	28.5-32.5	5.34	0.018	296.7
P-3	Dissolved	Arsenic	28.5-32.5	16.1	0.14	115
P-4		TCE	50-54	33.3	30	1.1
P-4	Dissolved	Arsenic	28-32	8	0.14	57.1
P-5	Dissolved	Arsenic	29-33	8.4	0.14	60
P-5	Dissolved	Arsenic	29-33	9	0.14	64.3
P-5	Dissolved	Arsenic	52-56	10.5	0.14	75
P-5	Dissolved	Arsenic	96-100	33.9	0.14	242.1
P-8	Dissolved	Arsenic	28-32	19.4	0.14	138.6
P-9	Dissolved	Arsenic	31-35	29.5	0.14	210.7
WS-8-33		Benzene	23-33	65.9	51	1.3
WS-8-33		Benzene	23-33	68	51	1.3
WS-8-33		Benzene	23-33	68.1	51	1.3
WS-8-33		Benzene	23-33	87.4	51	1.7
WS-8-33		Benzene	23-33	89.1	51	1.7
WS-8-33		Benzene	23-33	107	51	2.1
WS-8-33		Benzo (a) anthracene	23-33	0.25	0.018	13.9
WS-8-33		Benzo (a) anthracene	23-33	0.31	0.018	17.2
WS-8-33		Benzo (a) anthracene	23-33	0.32	0.018	17.8
WS-8-33		Benzo (a) anthracene	23-33	0.53	0.018	29.4
WS-8-33		Benzo (a) anthracene	23-33	0.55	0.018	30.6
WS-8-33		Benzo (a) anthracene	23-33	0.68	0.018	37.8
WS-8-33		Benzo (a) pyrene	23-33	0.15	0.018	8.3
WS-8-33		Benzo (a) pyrene	23-33	0.26	0.018	14.4
WS-8-33		Benzo (a) pyrene	23-33	0.27	0.018	15
WS-8-33		Benzo (b) fluoranthene	23-33	0.1	0.018	5.6
WS-8-33		Benzo (b) fluoranthene	23-33	0.11	0.018	6.1
WS-8-33		Benzo (b) fluoranthene	23-33	0.19	0.018	10.6
WS-8-33		Benzo (k) fluoranthene	23-33	0.12	0.018	6.7
WS-8-33		Benzo (k) fluoranthene	23-33	0.17	0.018	9.4
WS-8-33		Chrysene	23-33	0.3	0.018	16.7
WS-8-33		Chrysene	23-33	0.42	0.018	23.3
WS-8-33		Chrysene	23-33	0.44	0.018	24.4
WS-8-33		Chrysene	23-33	0.53	0.018	29.4

Table 6
Groundwater Results Exceeding Human Health Screening Criteria

Station	Total or Dissolved	Parameter	Depth (ft bgs)	Result (µg/L)	Criteria (µg/L)	Hazard Quotient
WS-8-33		Chrysene	23-33	0.6	0.018	33.3
WS-8-33		Chrysene	23-33	0.67	0.018	37.2
WS-8-33		Indeno (1,2,3-cd) pyrene	23-33	0.11	0.018	6.1
WS-8-33		Indeno (1,2,3-cd) pyrene	23-33	0.13	0.018	7.2
WS-8-33	Dissolved	Arsenic	23-33	14.8	0.14	105.7
WS-8-33	Dissolved	Arsenic	23-33	19.8	0.14	141.4
WS-8-33	Total	Arsenic	23-33	6.3	0.14	45
WS-8-33	Total	Arsenic	23-33	15.2	0.14	108.6
WS-8-33	Total	Arsenic	23-33	16.2	0.14	115.7
WS-8-33	Total	Arsenic	23-33	17.3	0.14	123.6
WS-8-33	Total	Arsenic	23-33	17.4	0.14	124.3
WS-8-33	Total	Arsenic	23-33	18	0.14	128.6
WS-8-59		Benzo (a) anthracene	49-59	0.16	0.018	8.9
WS-8-59		Benzo (a) anthracene	49-59	0.17	0.018	9.4
WS-8-59		Benzo (a) anthracene	49-59	0.2	0.018	11.1
WS-8-59		Benzo (a) anthracene	49-59	0.23	0.018	12.8
WS-8-59		Benzo (a) anthracene	49-59	0.25	0.018	13.9
WS-8-59		Benzo (a) anthracene	49-59	0.32	0.018	17.8
WS-8-59		Benzo (a) pyrene	49-59	0.14	0.018	7.8
WS-8-59		Benzo (b) fluoranthene	49-59	0.1	0.018	5.6
WS-8-59		Benzo (k) fluoranthene	49-59	0.1	0.018	5.6
WS-8-59		Chrysene	49-59	0.23	0.018	12.8
WS-8-59		Chrysene	49-59	0.24	0.018	13.3
WS-8-59		Chrysene	49-59	0.29	0.018	16.1
WS-8-59		Chrysene	49-59	0.41	0.018	22.8
WS-9-34		Benzo (a) anthracene	24-34	0.11	0.018	6.1
WS-9-34		Benzo (a) pyrene	24-34	0.15	0.018	8.3
WS-9-34		Benzo (b) fluoranthene	24-34	0.1	0.018	5.6
WS-9-34		Benzo (k) fluoranthene	24-34	0.1	0.018	5.6
WS-9-34		Chrysene	24-34	0.17	0.018	9.4
WS-9-34		Indeno (1,2,3-cd) pyrene	24-34	0.12	0.018	6.7
WS-9-34	Dissolved	Arsenic	24-34	7	0.14	50
WS-9-34	Total	Arsenic	24-34	31.1	0.14	222.1
WS-9-34	Total	Arsenic	24-34	38	0.14	271.4
WS-9-34	Total	Arsenic	24-34	60.7	0.14	433.6

Table 7
Stormwater Results Exceeding Screening Values

Station	Total or Dissolved	Parameter	Result (µg/L)	Criteria (µg/L)	Type	Source	Hazard Quotient
Admin Area Outfall	Dissolved	Zinc	280	181*	Ecological	5x EPA 2002 Freshwater Acute	1.5
Fab 2 Area Outfall	Dissolved	Zinc	475	181*	Ecological	5x EPA 2002 Freshwater Acute	2.6

* Criterion expressed as a function of hardness. The value given here corresponds to a hardness of 25 mg/L, which is typical of the lower Willamette River (DEQ Water Quality Program). Criterion were calculated using the equation and parameters for calculating metals criteria that are hardness-dependent as found in Appendix B of EPA's AWQC.

Table 8
Soil Data Results Exceeding Screening Values

Station	Parameter	Depth (ft bgs)	Result (µg/kg)	Criteria (µg/kg)	Source	Hazard Quotient
CDA and chrome shed catch basins	Benz (a) anthracene	NA	200	32	ODEQ 2001	6.2
CDA and chrome shed catch basins	Benzo (a) pyrene	NA	200	32	ODEQ 2001	6.2
CDA and chrome shed catch basins	Benzo (k) fluoranthene	NA	200	27	ODEQ 2001	7.4
CDA and chrome shed catch basins	Chrysene	NA	300	57	ODEQ 2001	5.3
CDA and chrome shed catch basins	Fluoranthene	NA	400	111	ODEQ 2001	3.6
CDA and chrome shed catch basins	Indeno (1,2,3-cd) pyrene	NA	200	17	ODEQ 2001	11.8
CDA and chrome shed catch basins	Phenanthrene	NA	200	42	ODEQ 2001	4.8
CDA and chrome shed catch basins	Pyrene	NA	400	53	ODEQ 2001	7.5
CDA and chrome shed catch basins	Zinc	NA	360000	123000	ODEQ 2001	2.9
Fab 2 Outfall	Antimony	0.2	3310	3000	ODEQ 2001	1.1
Fab 2 Outfall	Benz (a) anthracene	0.2	7000	32	ODEQ 2001	218.8
Fab 2 Outfall	Benzo (a) pyrene	0.2	7100	32	ODEQ 2001	221.9
Fab 2 Outfall	Benzo (k) fluoranthene	0.2	6700	27	ODEQ 2001	248.1
Fab 2 Outfall	Chrysene	0.2	8700	57	ODEQ 2001	152.6
Fab 2 Outfall	Copper	0.2	286000	36000	ODEQ 2001	7.9
Fab 2 Outfall	Fluoranthene	0.2	21000	111	ODEQ 2001	189.2
Fab 2 Outfall	Phenanthrene	0.2	17500	42	ODEQ 2001	416.7
Fab 2 Outfall	Pyrene	0.2	23200	53	ODEQ 2001	437.7
Fab 2 Outfall	Zinc	0.2	846000	123000	ODEQ 2001	6.9

Table 9
Properties of Chemicals Exceeding One or More Screening Levels

Parameter	Koc (for organics) or Kd (for metals) (cm^3/g)	Pure component water solubility, S (mg/L)	Henry's law constant at reference temperature H (unitless)	Aqueous Biodegradation				Groundwater	
				Aerobic Half-Life		Anaerobic Half-Life		Half-Life	
				High (hour)	Low (hour)	High (hour)	Low (hour)	High (hour)	Low (hour)
Inorganics									
Arsenic	2.90E+01	NA	NA	NA	NA	NA	NA	NA	NA
Barium	4.10E+01	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	1.00E+03	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	N/AV	NA	NA	NA	NA	NA	NA	NA	NA
Copper	2.20E+01	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	6.50E+01	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1.00E+04	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	5.00E+00	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	N/AV	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	6.20E+01	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	N/AV	N/AV	N/AV	N/AV	N/AV	N/AV	N/AV	N/AV	N/AV
Polycyclic Aromatic Hydrocarbons									
Anthracene	2.95E+04	4.34E+02	2.67E-03	11040	1200	44160	4800	22080	2400
Benzo (a) anthracene	3.98E+05	9.40E-03	1.37E-04	16320	2448	65280	9792	32640	4896
Benzo (a) pyrene	1.02E+06	1.62E-03	4.63E-05	12720	1368	50880	5472	25440	2736
Benzo (b) flouranthene	1.23E+06	8.00E-04	3.40E-05	14640	8640	58560	34560	29280	17280
Benzo (k) flouranthene	1.23E+06	8.00E-04	3.40E-05	51360	21840	205440	87360	102720	42680
Fluoranthene	1.07E+05	2.06E-01	6.60E-04	10560	3360	42240	13440	21120	6720
Fluorene	1.38E+04	1.98E+00	2.61E-03	1440	768	5760	3072	2880	1536
Phenanthrene	N/AV	N/AV	N/AV	4800	384	19200	1536	9600	768
Chrysene	3.98E+05	1.60E-03	3.88E-03	24000	8904	96000	35616	48000	17808
Indeno (1,2,3-cd) pyrene	3.47E+06	2.20E-05	6.56E-05	17520	14400	70080	57600	35040	28800
Semi-Volatile Compounds									
Bis (2-ethyl hexyl) phthalate	1.51E+07	3.40E-01	4.18E-06	550	120	9336	980	9336	240
Butyl benzyl phthalate	5.75E+04	2.69E+00	5.17E-05	168	24	4320	672	4320	48
Dibenzofuran	2.00E+03	N/AV	N/AV	672	168	2688	672		205
Volatile Compounds									
1,1-DCE	5.25E+01	2.25E+03	1.07E+00	4320	672	4152	1944	3168	1344
Benzene	5.89E+01	1.75E+03	2.28E-01	384	120	17280	2688	17280	240
Chlorobenzene	2.19E+02	4.72E+02	1.52E-01	3600	1632	14400	6528	7200	3264
cis-1,2-DCE	3.55E+01	3.50E+03	1.67E-01	N/AV	N/AV	N/AV	N/AV	230	170
Ethylbenzene	3.63E+02	1.69E+02	3.23E-01	240	72	5472	4224	5472	144
Naphthalene	2.00E+03	3.10E+01	1.98E-02	480	12	6192	600	6192	24
TCE	5.01E+01	1.11E+03	4.22E-01	8640	4320	39672	2532	39672	7704
Vinyl Chloride	1.86E+01	2.76E+03	1.11E+00	4320	672	17280	2688	69000	1344
Xylene	3.63E+02	1.85E+02	2.13E-01	672	168	8640	4320	8640	336

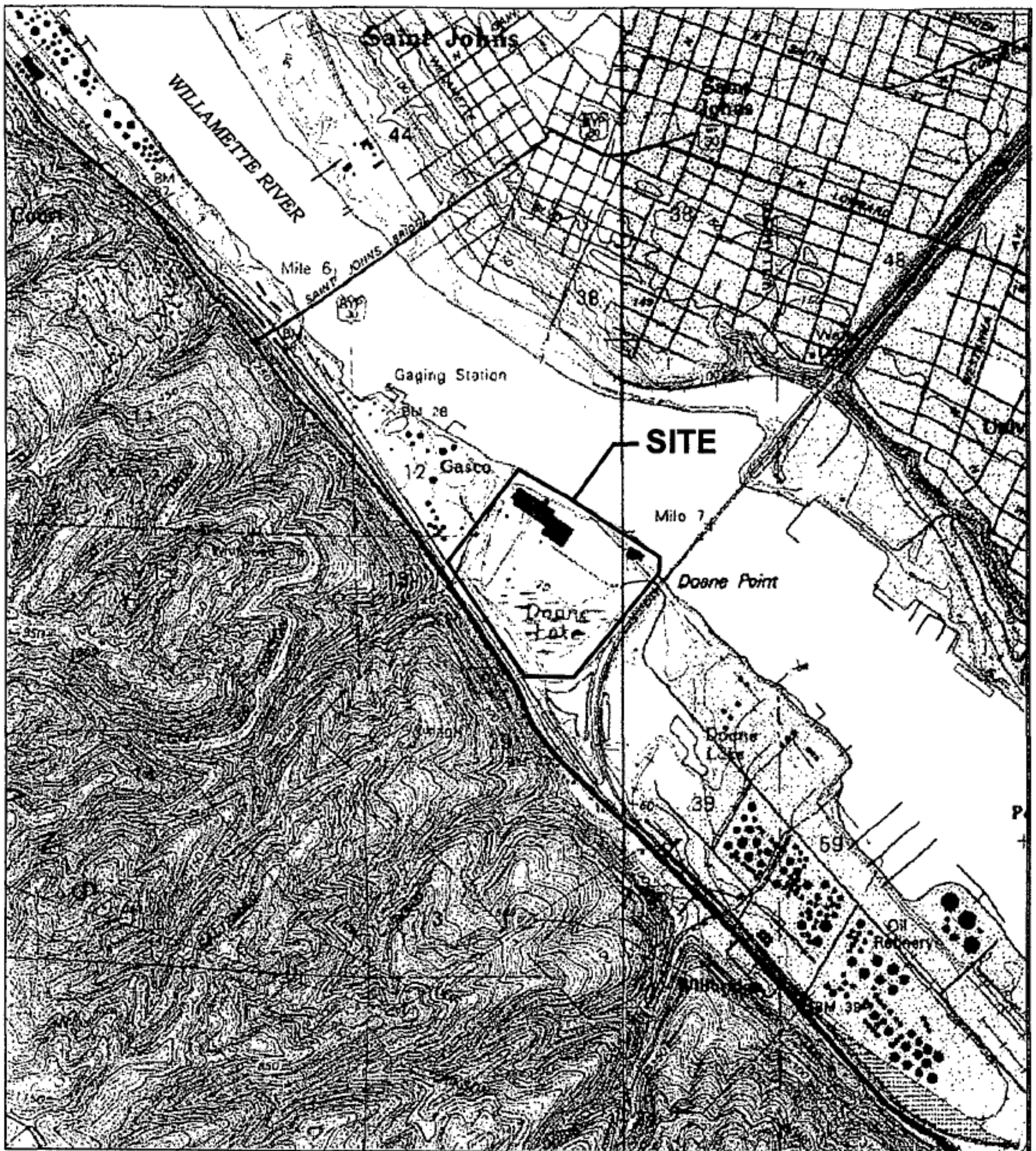
Notes:

1. Koc, Solubility, and Henry's Constant data from Soil Screening Level (SSL) Guidance Documents, USEPA (1996)
2. Degradation data from Howard et al (1991) and Yager (2002) (cis-1,2-DCE).
3. Kd data from USEPA 1996 assuming pH of 6.8 and Model Toxics Control Act of Washington State.

Table 10
Calculation of Travel Times and Degradation Rates for Chemicals Exceeding Screening Values

Parameter	Koc (for organics) or Kd (for metals) (cm^3/g)	Groundwater Half-Life		Retardartion Factor	Nearest Distance (ft) of Well with Higher HQ	HQ at Well	High Range Groundwater Velocity (ft/yr)	Chemical Travel Time (yr)	Degraded Concentration (HQ) Over Travel Time (using slowest half life)
		High (hour)	Low (hour)						
Inorganics									
Arsenic	2.90E+01	NA	NA	170	50	210.7	47	179	210.7
Barium	4.10E+01	NA	NA	240	70	230.8	47	354	230.8
Chromium	1.00E+03	NA	NA	5834	230	55.5	47	28,280	55.5
Cobalt	N/AV	NA	NA	N/AV	230	5.8	47	N/AV	5.8
Copper	2.20E+01	NA	NA	129	230	119.3	47	627	119.3
Nickel	6.50E+01	NA	NA	380	230	21.8	47	1,843	21.8
Lead	1.00E+04	NA	NA	58334	230	66.5	47	282,759	66.5
Selenium	5.00E+00	NA	NA	30	160	3.2	47	102	3.2
Vanadium	N/AV	NA	NA	N/AV	230	31.8	47	N/AV	31.8
Zinc	6.20E+01	NA	NA	363	230	46.3	47	1,758	46.3
Cyanide	N/AV	N/AV	N/AV	N/AV	N/AV	139	47	N/AV	139
Polycyclic Aromatic Hydrocarbons									
Anthracene	2.95E+04	22080	2400	861	30	1.5	47	545	1.4E-65
Benzo (a) anthracene	3.98E+05	32640	4896	11609	30	233.3	47	7,340	0.0
Benzo (a) pyrene	1.02E+06	25440	2736	29751	30	302.1	47	18,810	0.0
Benzo (b) flouranthene	1.23E+06	29280	17280	35876	30	117.8	47	22,682	0.0
Benzo (k) flouranthene	1.23E+06	102720	42680	35876	50	9.4	47	37,804	0.0
Fluoranthene	1.07E+05	21120	6720	3122	30	4.4	47	1,974	1.6E-246
Fluorene	1.38E+04	2880	1536	404	30	11	47	255	2.8E-233
Phenanthrene	N/AV	9600	768	N/AV	30	14	47	N/AV	N/AV
Chrysene	3.98E+05	48000	17808	11609	30	296.7	47	7,340	0.0
Indeno (1,2,3-cd) pyrene	3.47E+06	35040	28800	101209	50	7.2	47	106,648	0.0
Semi-Volatile Compounds									
Bis (2-ethyl hexyl) phthalate	1.51E+07	9336	240	440418	250	2.5	47	2,320,430	0.0
Butyl benzyl phthalate	5.75E+04	4320	48	1678	50	1.2	47	1,768	0.0
Dibenzofuran	2.00E+03	835	205	59	30	1.7	47		1.70E+00
Volatile Compounds									
1,1-DCE	5.25E+01	3168	1344	3	250	11.2	47	13	0.0
Benzene	5.89E+01	17280	240	3	50	2.1	47	3	0.8
Chlorobenzene	2.19E+02	7200	3264	7	160	4	47	25	0.0
cis-1,2-DCE	3.55E+01	230	170	2	190	11.7	47	8	0.0
Ethylbenzene	3.63E+02	5472	144	12	30	4.1	47	7	0.0
Naphthalene	2.00E+03	6192	24	59	30	1.5	47	38	0.0
TCE	5.01E+01	39672	7704	2	190	373.3	47	10	82.6
Vinyl Chloride	1.86E+01	69000	1344	2	250	11.9	47	8	5.8
Xylene	3.63E+02	8640	336	12	50	4.1	47	12	0.0

Figures



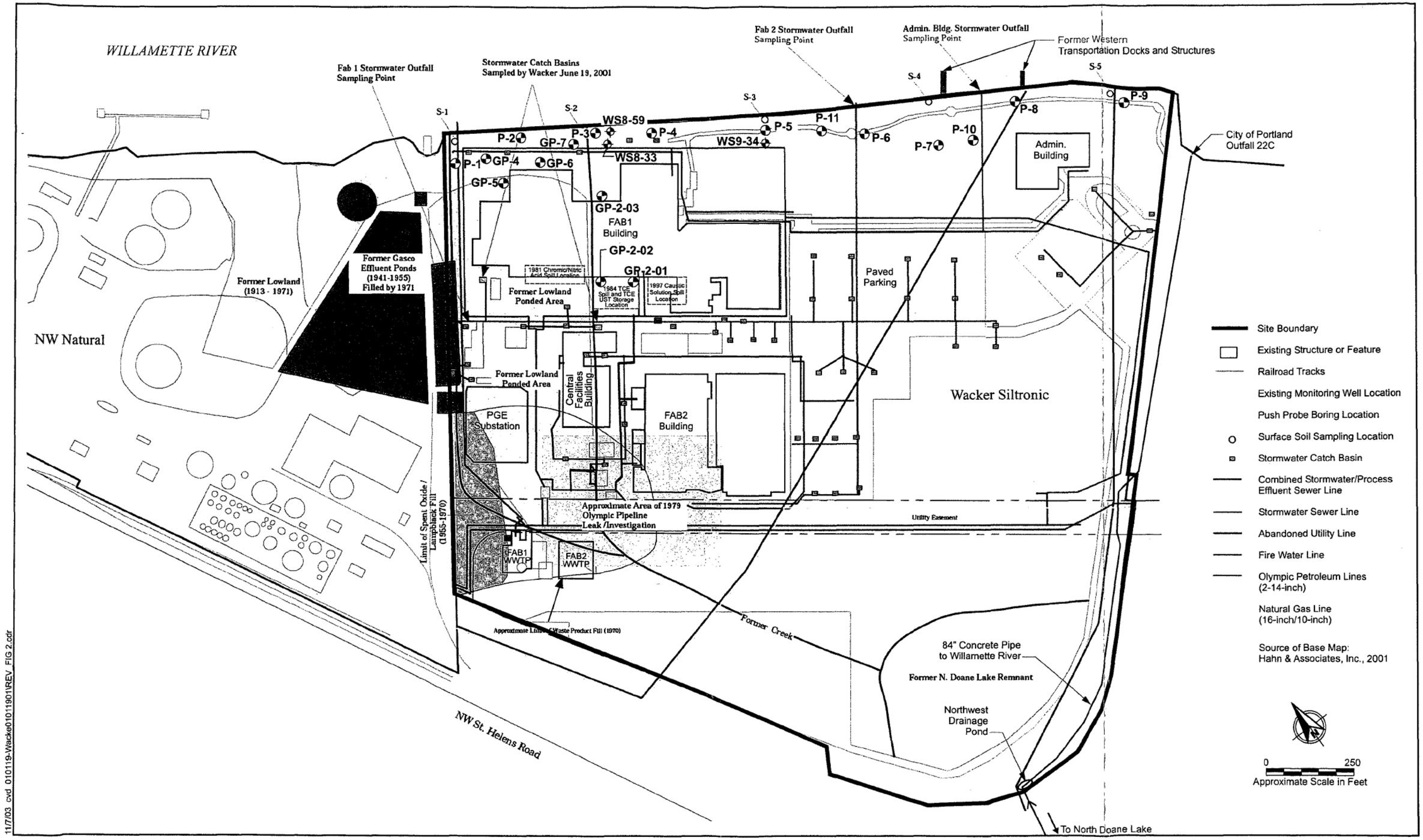
Note: Base map prepared from USGS 7.5 quadrangle maps of Linnton (1990) and Portland (1990), Oregon.

0 2000
Scale in Feet

Sep 30, 2003 11:24am cdavidson K:\Jobs\010119-Wacker\01011901\01011901\0103.dwg FIG 1

ANCHOR ENVIRONMENTAL, L.L.C.

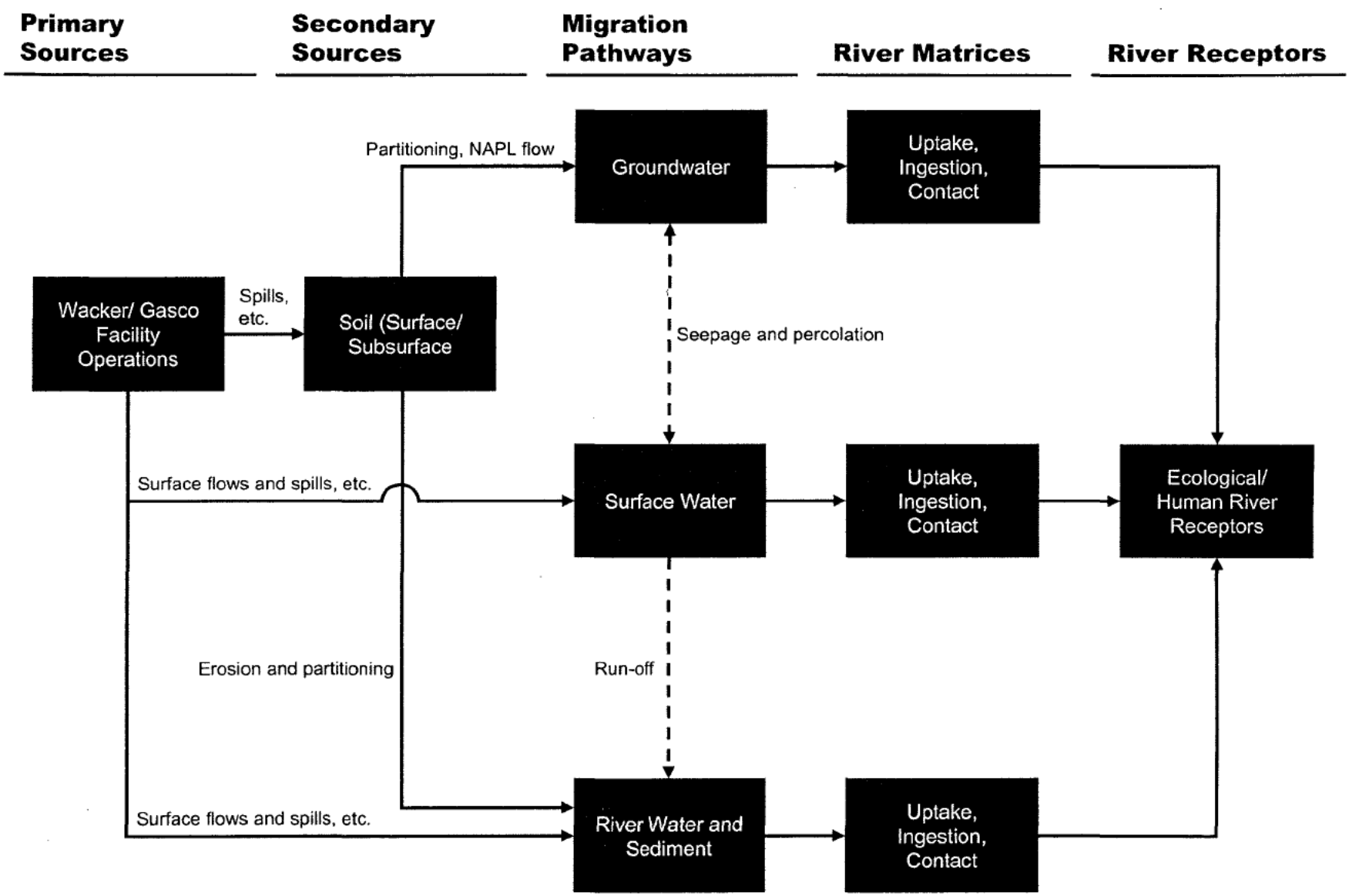
Figure 1
Vicinity Map
Wacker Siltronic
Lower Willamette River



11/7/03 cvd 010119-Wacke01011901\REV FIG 2.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

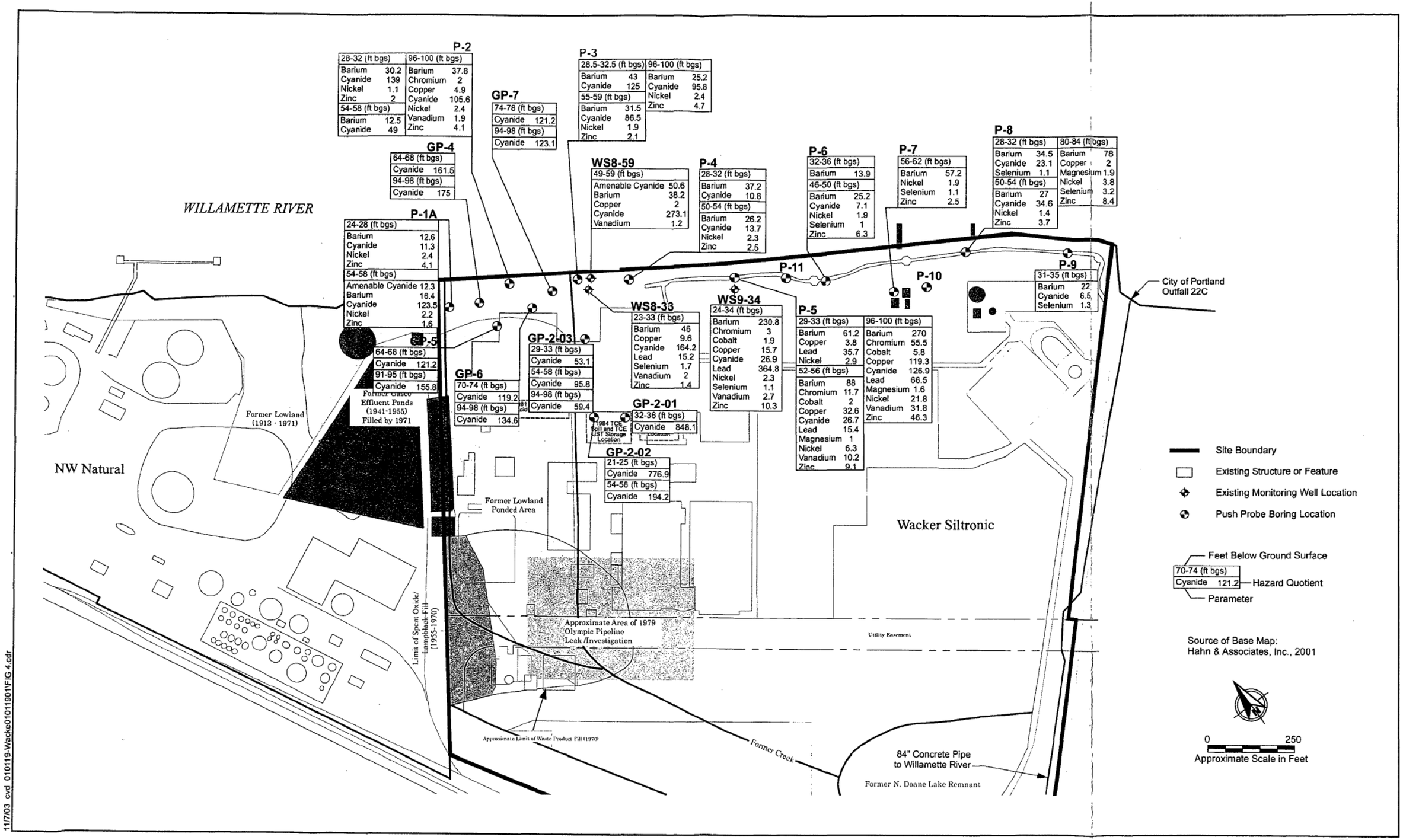
Figure 2
Site Map and Historical Features
Wacker Siltronic
Lower Willamette River



05/9/03 cvd CAD\Jobs\010119\01011901\Fig 3.ppt

ANCHOR ENVIRONMENTAL, L.L.C.

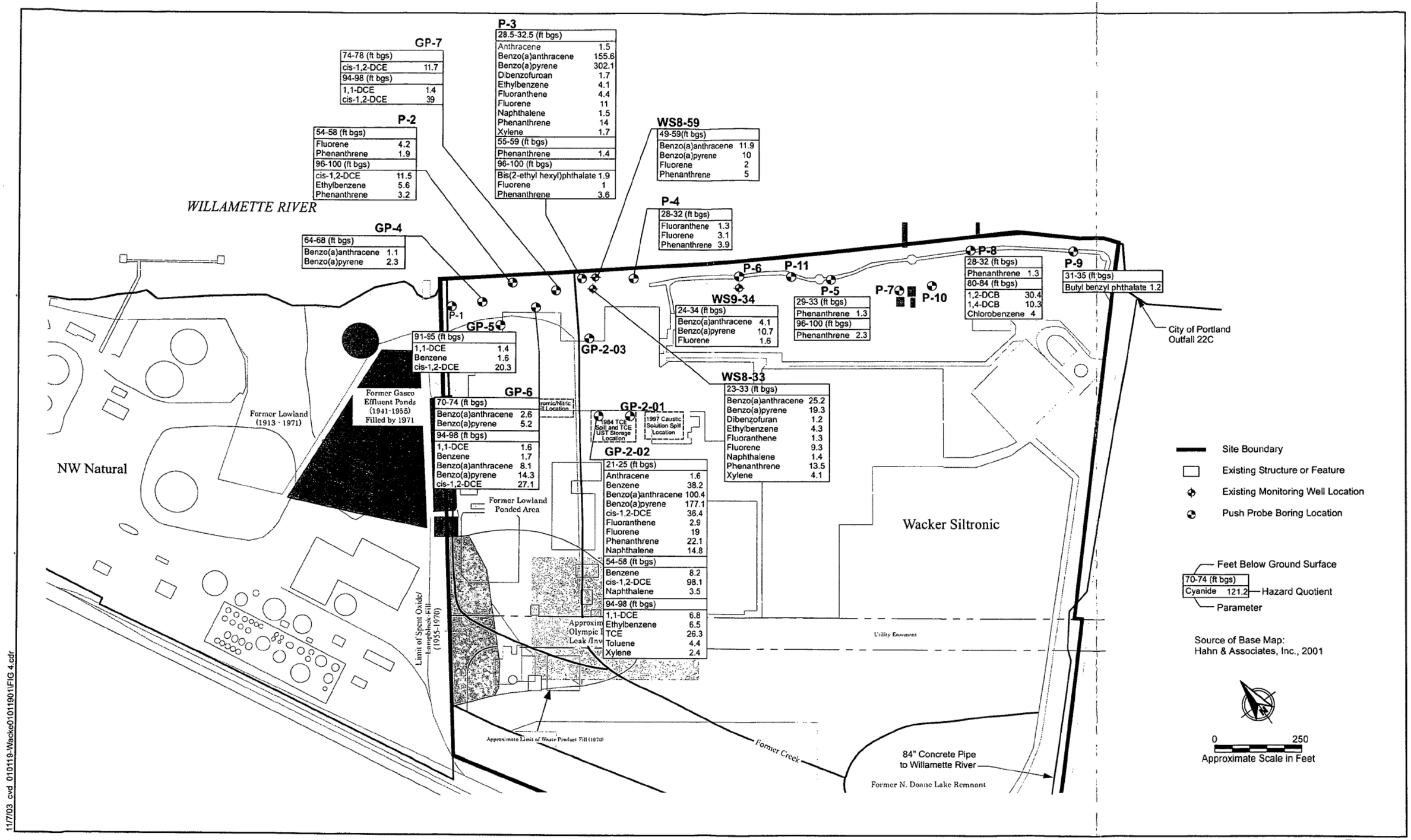
Figure 3
Conceptual Site Diagram
Wacker Siltronic
Lower Willamette River



11/7/03 cvd 010119-Wacke01011901FIG 4.cdr

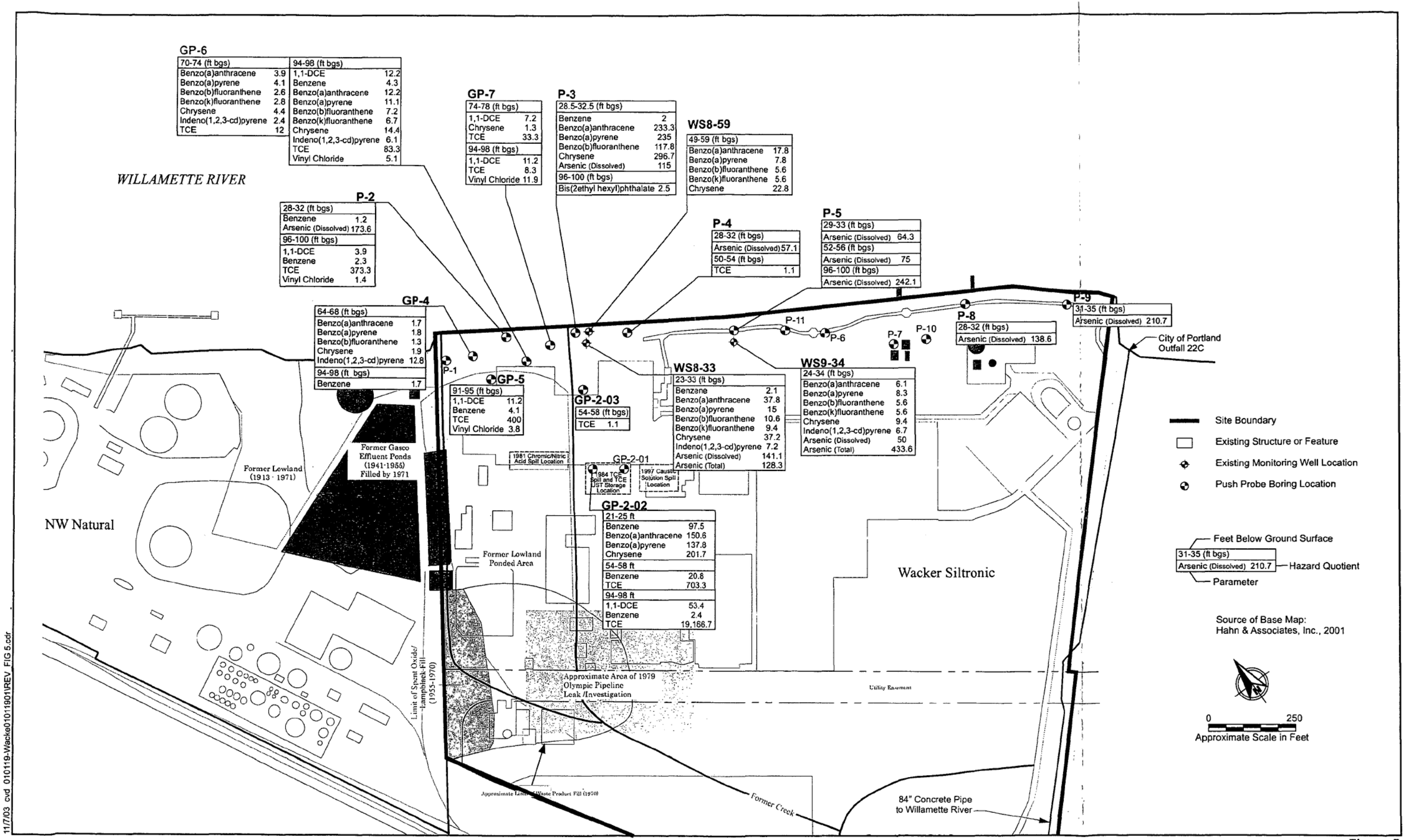
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4A
Groundwater Exceedances
and Hazard Quotients (Ecological - Inorganic)
Wacker Siltronic
Lower Willamette River



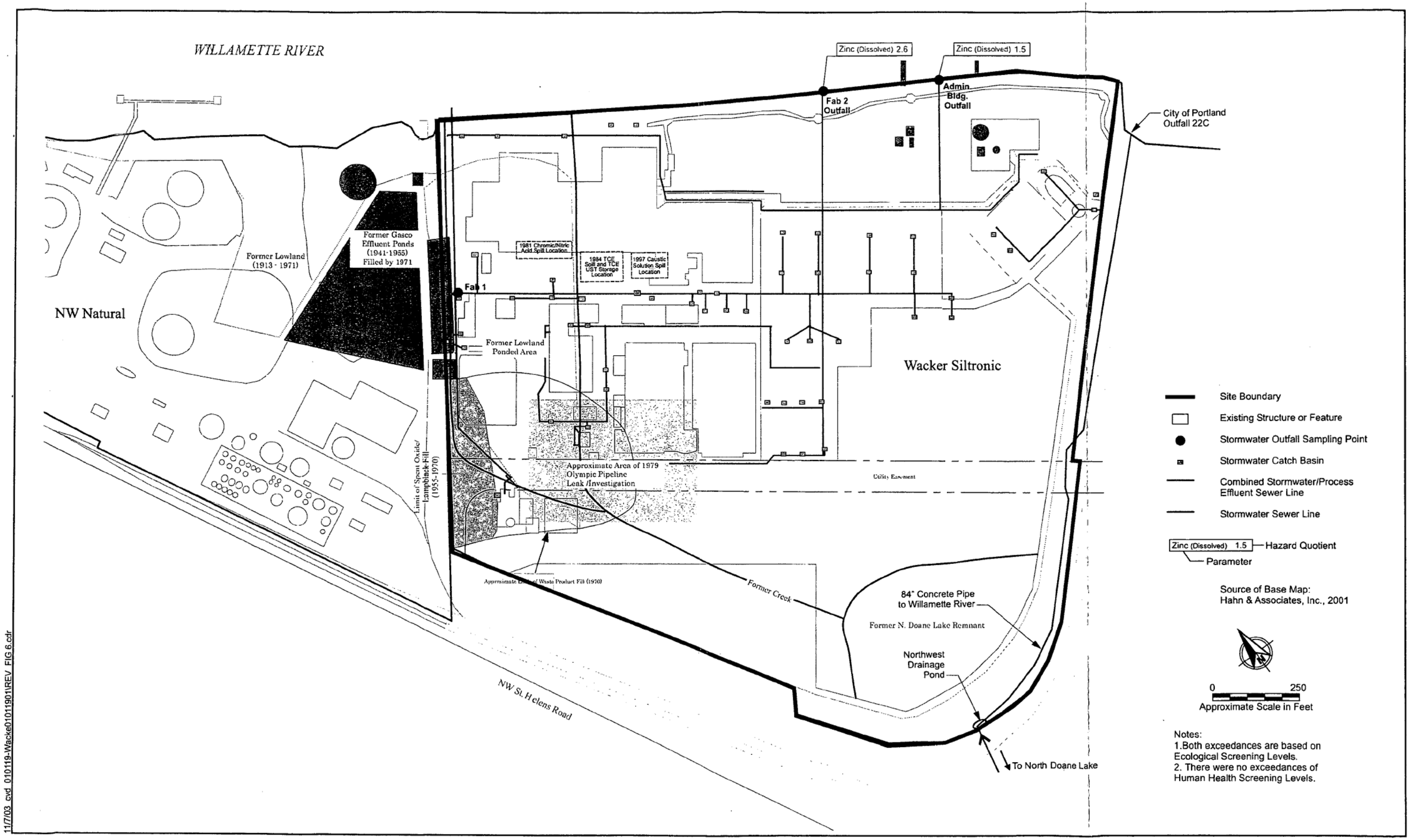
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4B
Groundwater Exceedances
and Hazard Quotients (Ecological - Organic)
Wacker Siltronic
Lower Willamette River



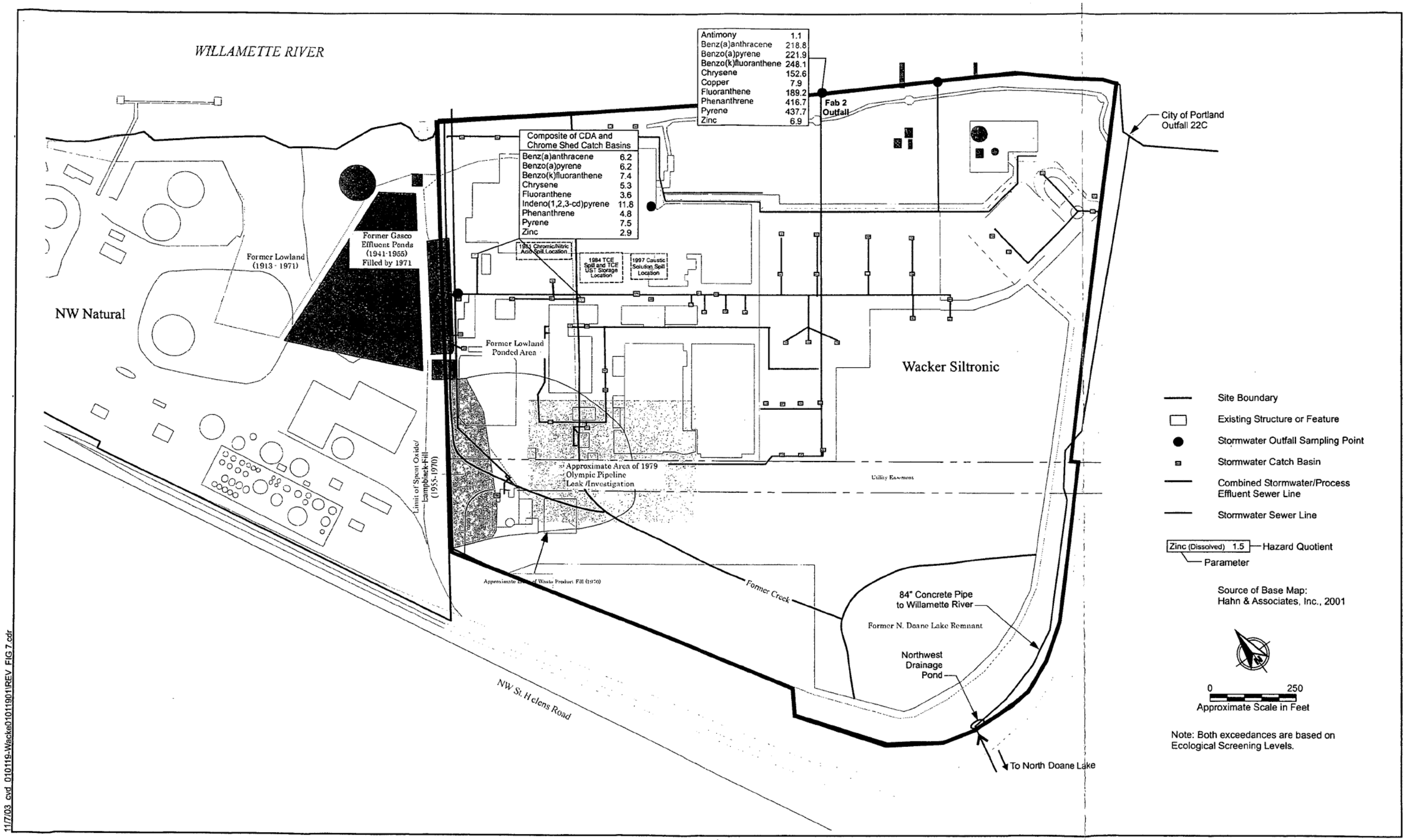
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5
Groundwater Exceedances
and Hazard Quotients (Human Health)
Wacker Siltronic
Lower Willamette River



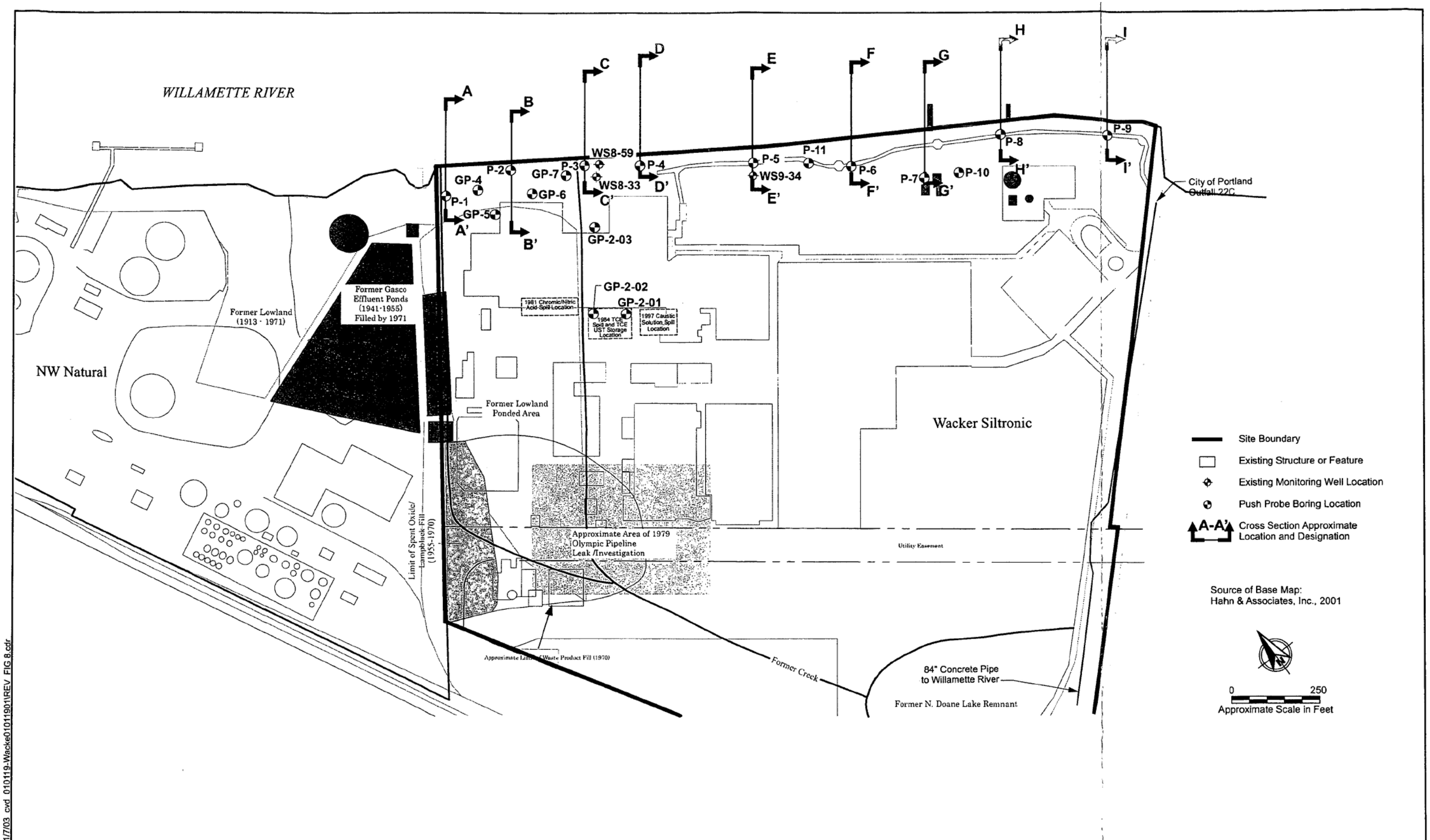
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 6
Stormwater Exceedances and Hazard Quotients
Wacker Siltronic
Lower Willamette River



ANCHOR ENVIRONMENTAL, L.L.C.

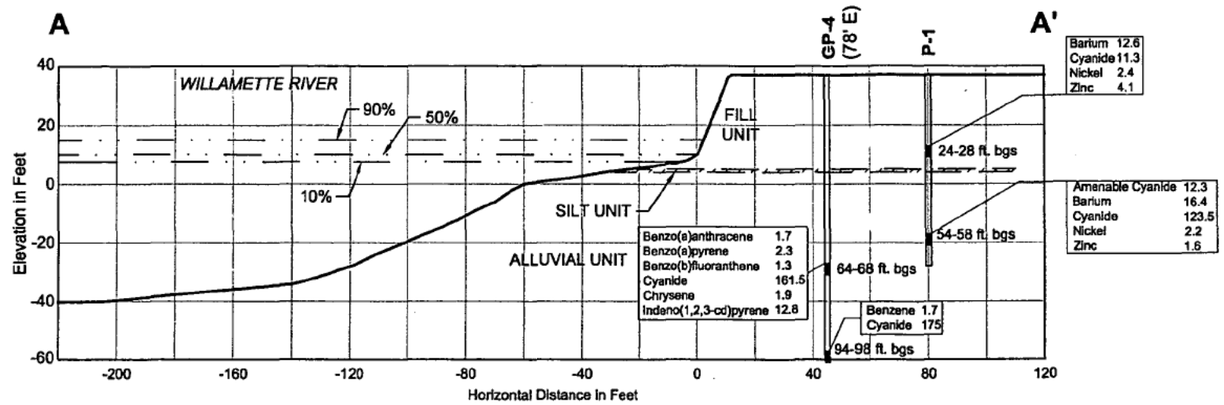
Figure 7
Soil Exceedances and Hazard Quotients
Wacker Siltronic
Lower Willamette River

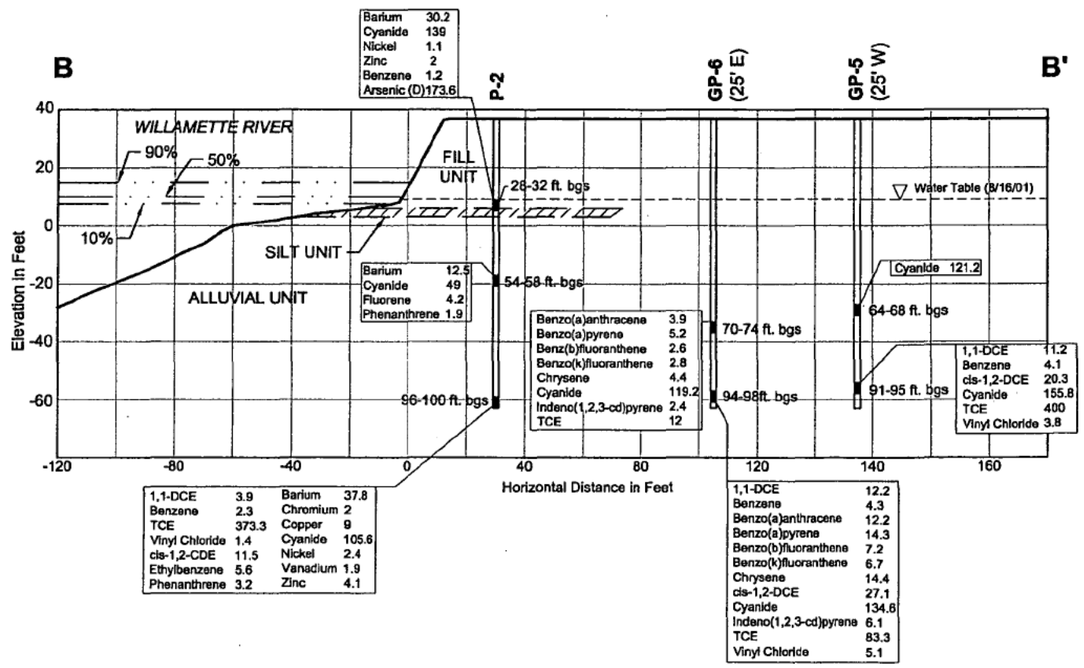


11/7/03 cvd 010119-Wacke0101901\REV FIG 8.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 8
Site Map with Cross-Sections
Wacker Siltronic
Lower Willamette River





P-3 Boring Number

Boring Location

Screened Interval

ft. bgs Feet Below Ground Surface

Chemical
Barium 30.2
Hazard Quotient

(D) Dissolved

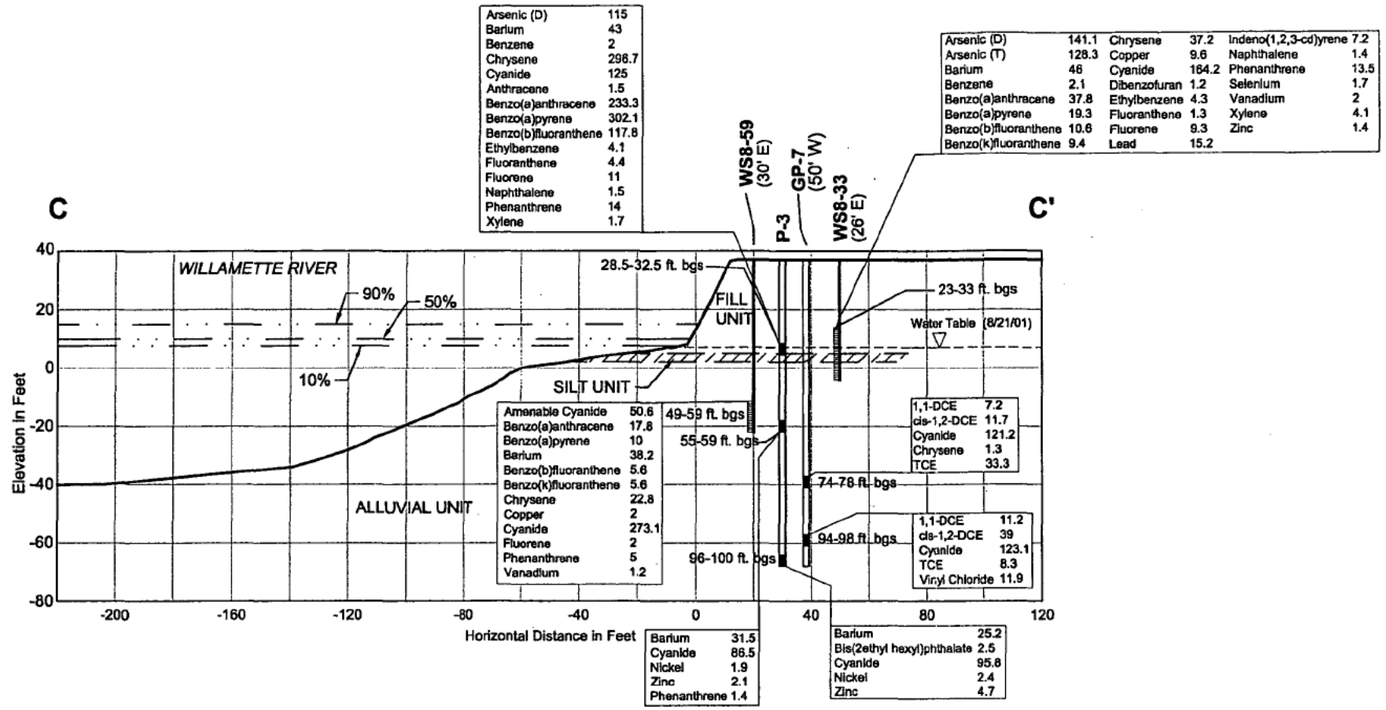
0 50
Scale in Feet

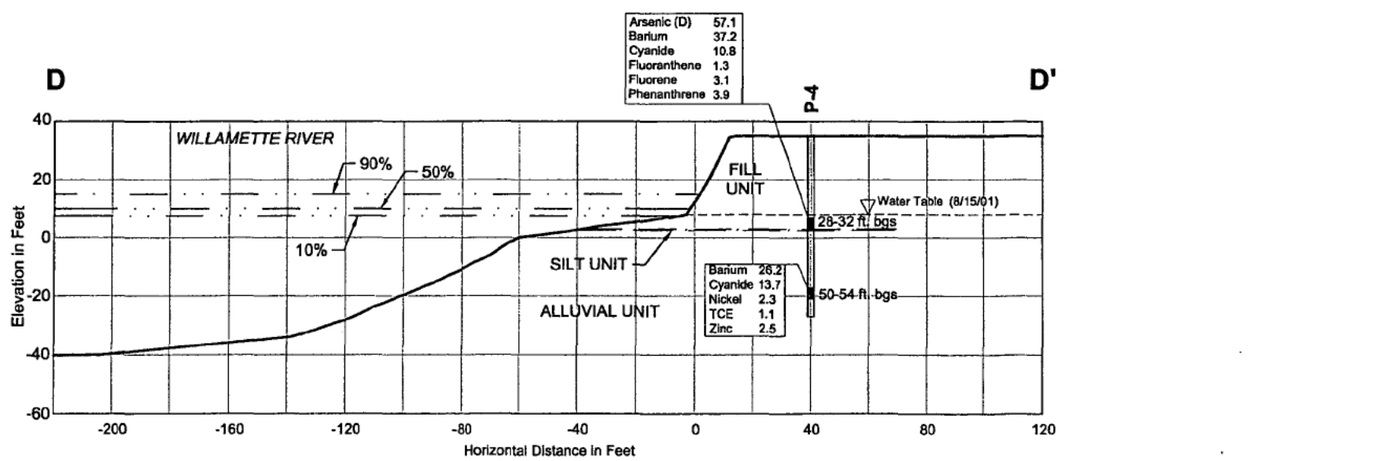
Vertical Datum: NAVD 1988

Plotted: Sep 30, 2003 11:24am cdavidson K:\Jobs\010119-Wacker\010119010101190104.dwg FIG 9

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 9
Cross Sections A-A' and B-B'
Wacker Siltronic
Lower Willamette River





WS8-59 Well Number
Well Location
Screen Interval

P-3 Boring Number
Boring Location
Screened Interval

ft. bgs Feet Below Ground Surface

Chemical
Barium 30.2
Hazard Quotient

(D) Dissolved

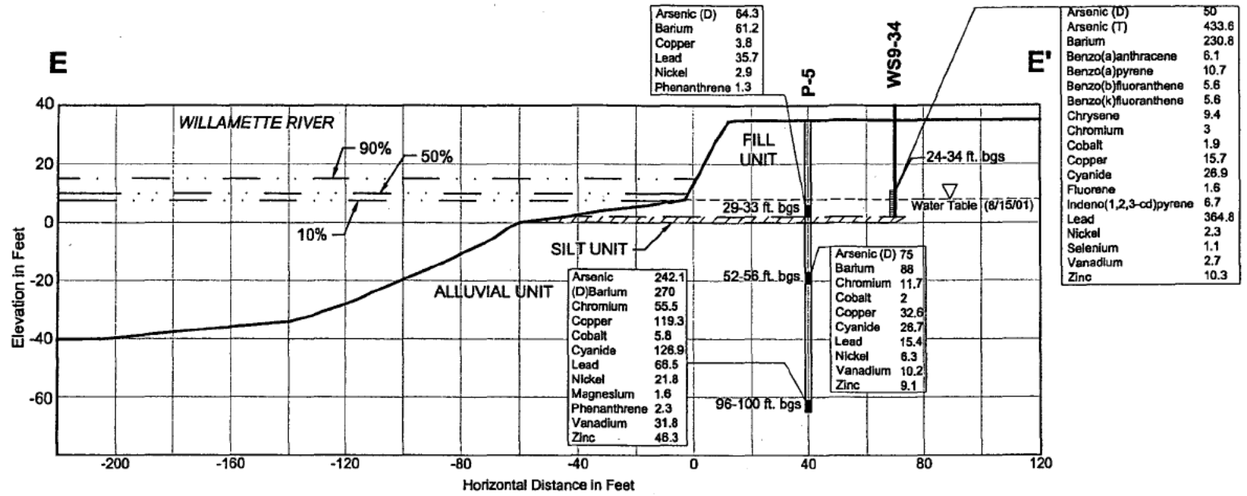
0 50
Scale in Feet

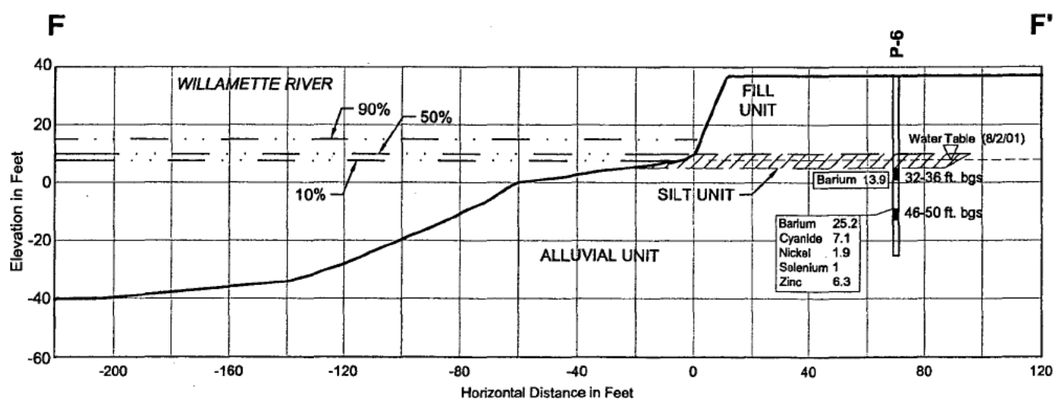
Vertical Datum: NAVD 1988

Plotted: Oct 06, 2003 11:05am cdavidson K:\Jobs\010119-Wacker\010119010\010119010104.dwg FIG 10

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 10
Cross Sections C-C' and D-D'
Wacker Siltronic
Lower Willamette River





WS8-59 Well Number

Well Location

Screen Interval

P-3 Boring Number

Boring Location

Screened Interval

ft. bgs Feet Below Ground Surface

Chemical

Barium 30.2

Hazard Quotient

(D) Dissolved

0 50

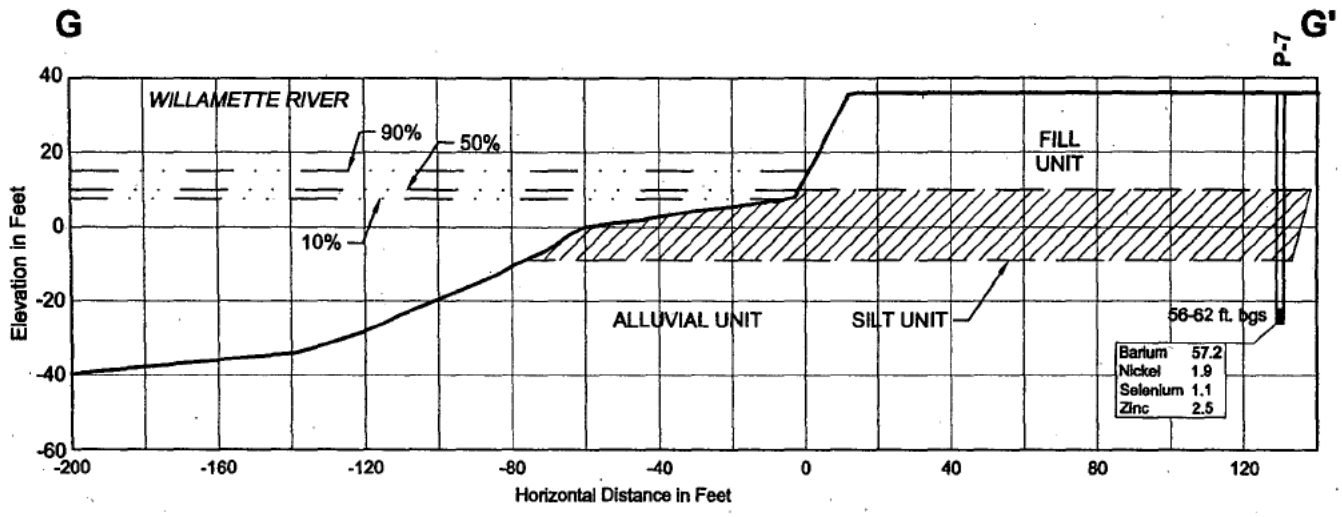
Scale in Feet

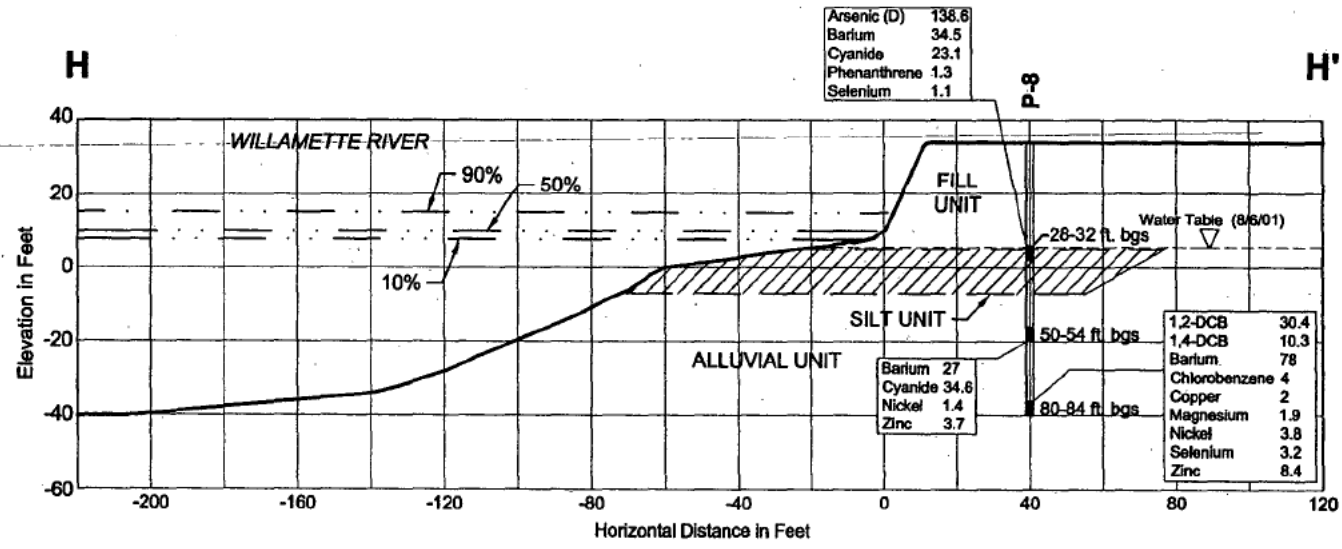
Vertical Datum: NAVD 1988

Plotted: Sep 30, 2003 11:25am cdavidson K:\Jobs\010119-Wacker\01011901\01011901\01190104.dwg FIG 11

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 11
Cross Section E-E' and F-F'
Wacker Siltronic
Lower Willamette River





Chemical
Barium 57.2
Hazard Quotient

P-7 Boring Number

Boring Location

Screened Interval

ft. bgs Feet Below Ground Surface

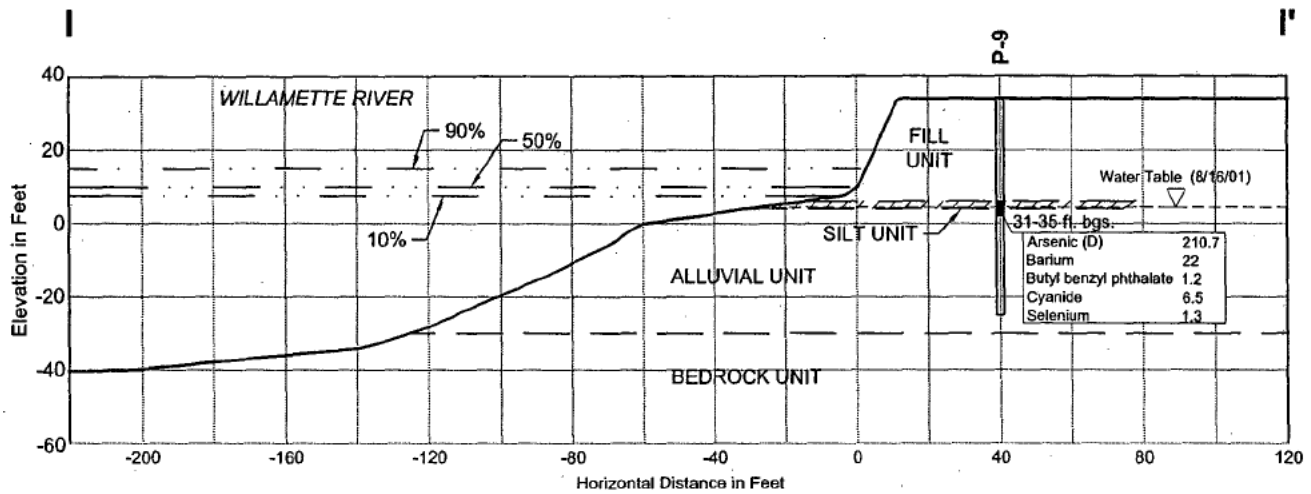
0 50
Scale in Feet

Vertical Datum: NAVD 1988

Plotted: Sep 30, 2003 11:25am cdavidson K:\Jobs\010119-Wacker\010119\01190104.dwg FIG 12

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 12
Cross Sections G-G' and H-H'
Wacker Siltronic
Lower Willamette River



Chemical
Arsenic (D) 210.7
Hazard Quotient

(D) Dissolved

P-9 Boring Number

Boring Location

Screened Interval

ft. bgs Feet Below Ground Surface

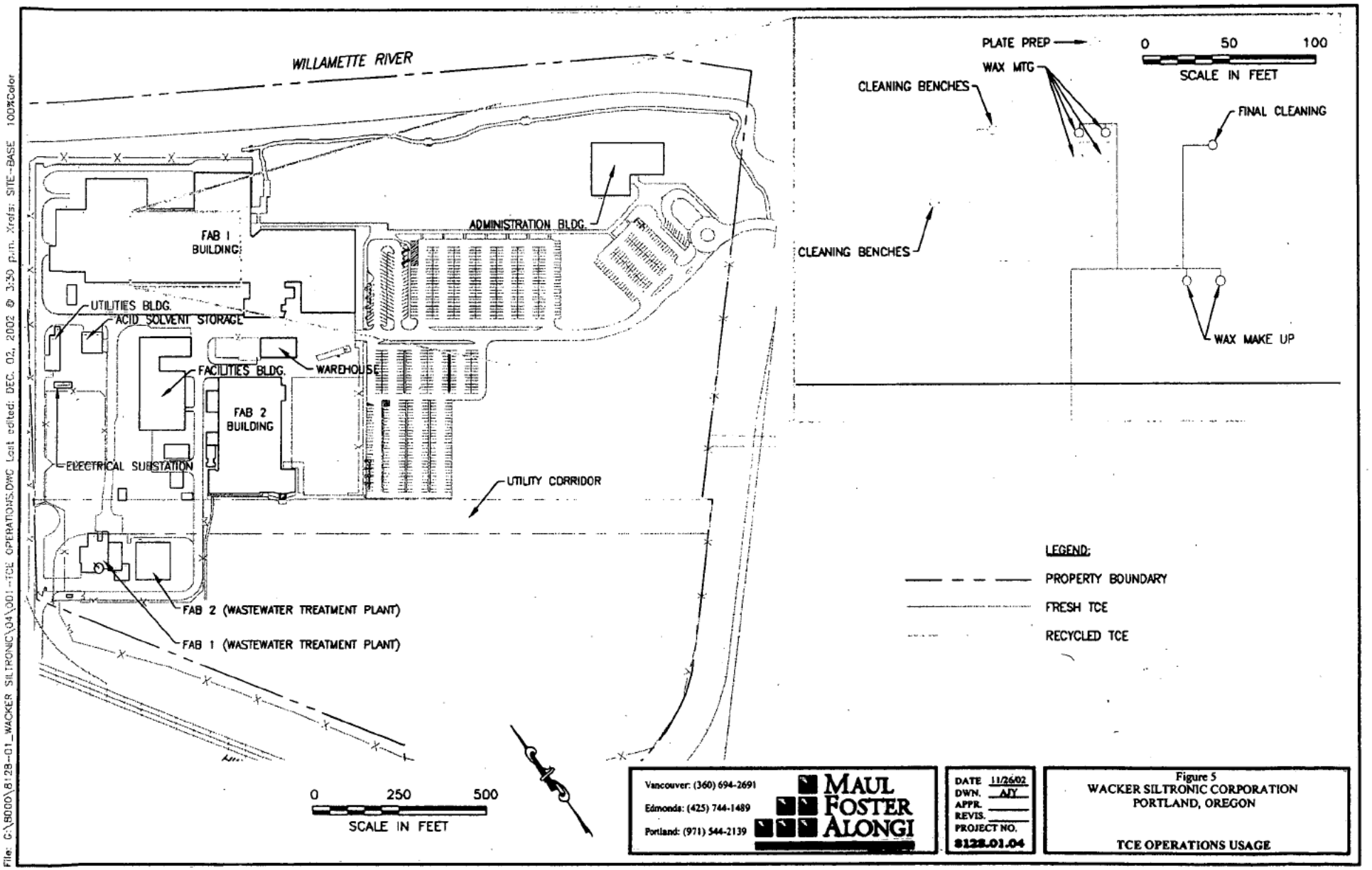
0 50
Scale in Feet

Vertical Datum: NAVD 1988

Plotted: Sep 30, 2003 11:25am cdavidson K:\Jobs\010119-Wacker\01011901\0101190104.dwg FIG 13

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 13
Cross Section I-I'
Wacker Siltronic
Lower Willamette River



Vancouver: (360) 694-2691
Edmonds: (425) 744-1489
Portland: (971) 544-2139

MAUL FOSTER ALONGI

DATE 11/26/02
DWN. AJY
APPR.
REVIS.
PROJECT NO. 8128.01.04

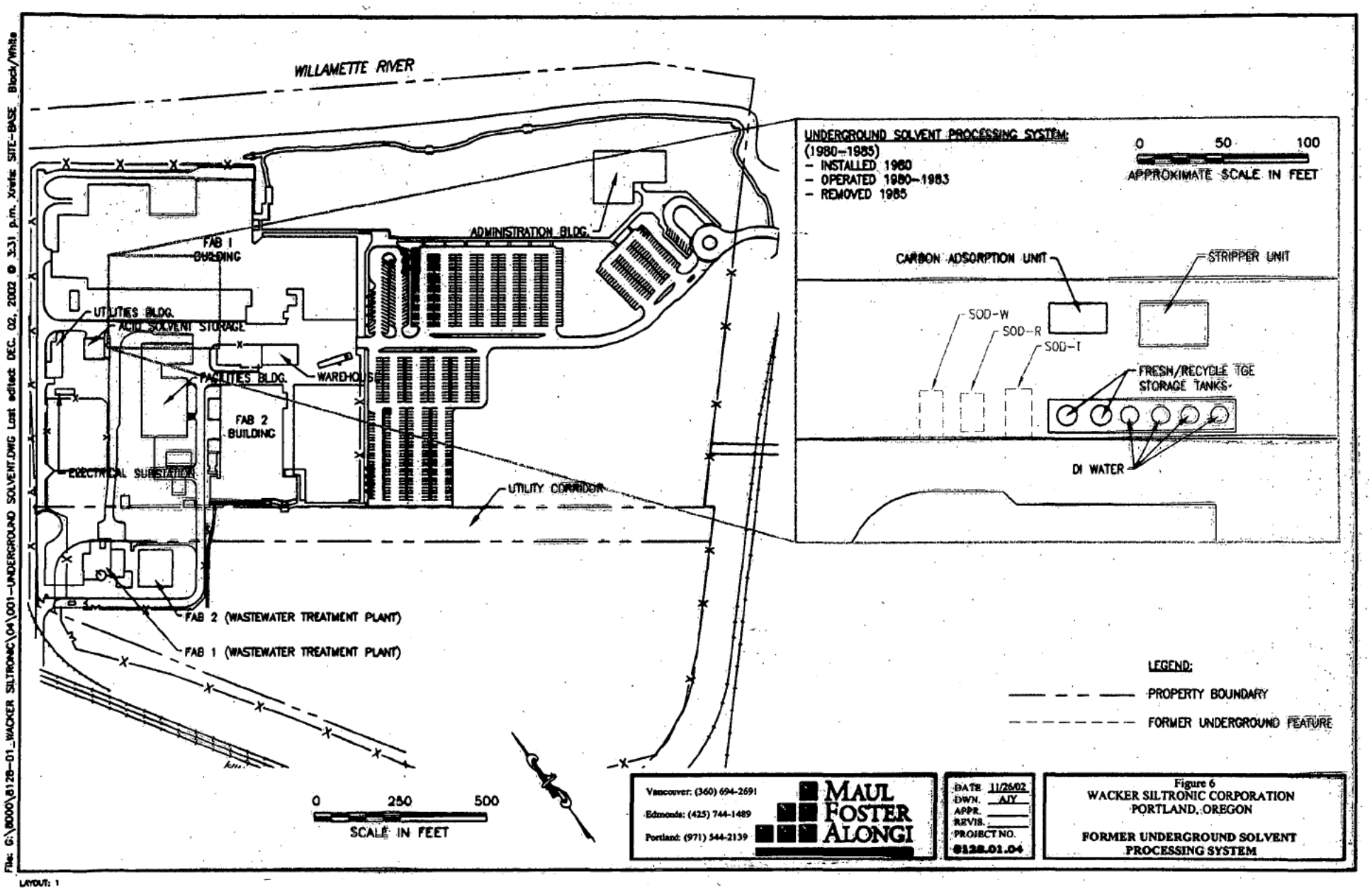
Figure 5
WACKER SILTRONIC CORPORATION
PORTLAND, OREGON

TCE OPERATIONS USAGE

File: C:\8000\8128-01_WACKER SILTRONIC\04\001-TCE OPERATIONS.DWG Last edited: DEC. 02, 2002 @ 3:30 p.m. Xrefs: SITE-BASE 100%Color

LAYOUT: 1

SCOEPA00011984



SCOEPA00011985

I. Historical material

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: HW-113

RECEIVED
ENGINEERING
OCT 24 1988
John L. Pittman
Wacker Siltronic

John Pittman
Wacker Siltronic
P.O. Box 03180
Portland, Oregon 97203

Dear Mr. Pittman:

Re: NL/Gould Superfund Site, Portland, Oregon

On February 18, 1988, the Environmental Protection Agency (EPA) notified you that it had documented the release or threatened release of hazardous substances at the above-referenced site. The EPA also notified you that it has information indicating that you or your company may be a responsible party for the groundwater unit at the NL/Gould site. This letter is to inform you of the agreements between EPA and the Oregon Department of Environmental Quality (DEQ) on the investigation of groundwater contamination associated with the "groundwater unit" of the NL/Gould Superfund site in Portland.

At DEQ's request, EPA has agreed that the state should be the lead agency responsible for the investigations of the groundwater unit. Accordingly, it is EPA's understanding that DEQ will use state authorities and resources to arrange for a Remedial Investigation to supplement the Remedial Investigation/ Feasibility Study performed by NL and Gould, which partially evaluated the nature and extent of contamination of the groundwater unit at this site. Details of this arrangement are included in the enclosed letter from EPA to DEQ dated September 13, 1988.

As part of this agreement, DEQ intends to: identify Potentially Responsible Parties (PRPs) for the groundwater unit; provide appropriate notice, define a Scope of Work based on the Scope of Work prepared for this site by EPA's contractor (included in this letter as an enclosure); and require consenting PRPs to properly and promptly conduct the investigation under a negotiated agreement. EPA will not be signatory to a negotiated agreement between the state and PRPs for the groundwater investigation. However, EPA is willing to provide a letter indicating its intent regarding future EPA action with respect to any order that is signed by DEQ.

EPA and DEQ have agreed that if the state has not reached an acceptable agreement with the PRPs by March 31, 1989, the agencies will reevaluate options for accomplishing the investigation in a timely manner, including the use of federal funds, if available.

The results of the groundwater unit investigation will be used by DEQ and EPA to decide on the need for remedial actions for the NL/Gould groundwater unit. (The Record of Decision issued by EPA in March 1988 for the NL/Gould soils unit stated that EPA was deferring a decision on groundwater remediation to a later date).

We appreciate the cooperation you have shown in responding to our information request. If you have any questions on EPA's future role in this process, EPA's primary contact on this matter will be Alan Goodman of the Oregon Operations Office at (503) 229-5254.

Sincerely,

for George C Hofer

Chuck Findley, Director
Hazardous Waste DIvision

Enclosures

cc: Al Goodman, Oregon Operations Office
Fred Hansen, DEQ
Bill Renfroe, DEQ

NEIL GOLDSCHMIDT
GOVERNOR

Department of Environmental Quality

811 SW SIXTH AVENUE, PORTLAND, OREGON 97204-1334 PHONE (503) 229-5696

RECEIVED
ENGINEERING
NOV 18 1988
John C. Pittman
Wacker Siltronic

November 15, 1988

Mr. John Pittman
Wacker Siltronic
P. O. Box 03180
Portland, OR 97203

Re: Request to Participate in Consent Order Negotiations for the Doane Lake Study

Dear Mr. ~~Pittman~~ John:

It has been agreed upon with EPA that the Oregon Department of Environmental Quality (DEQ) will act as the lead agency for an investigation of the groundwater unit associated with the Gould/NL site.

You are hereby notified that Wacker Siltronic has been identified by the DEQ as an owner/operator, pursuant to ORS 466.540 through 466.590, with regard to the groundwater unit associated with the Gould/NL site. The Department intends to proceed with the groundwater unit investigation, referred to as the Doane Lake Study, using the above referenced authority. At this time DEQ has decided to limit the investigation to the scope of work proposed by the EPA. A copy of this scope of work was mailed to you by EPA on or about October 21, 1988.

You or representatives of your firm are requested to attend a meeting on Thursday, December 1, 1988, at DEQ's offices. The meeting will begin at 10:00 a.m. and will convene in the fourth floor conference room. The intent of the meeting is to initiate discussions that will result in a signed consent order prior to the EPA imposed deadline of March 31, 1989.

If you have any questions or need additional information, please contact Bill Renfroe, Site Response Section, at (503) 229-6900.

Sincerely,

Fred Hansen
Director

WTR:m
SM1752
cc: Chuck Findley-EPA Region X
Al Goodman-EPA 000
Larry Edelman-DOJ
Mike Downs-ECD
Tom Miller-SRS
Tom Bispham-RO

Similar letters sent to:
David Simon - Liquid Air Corp.
Eddmond Bolin - NW Natural Gas Co.
Roger Sherwood - ESCO
David Waldschmidt - Pacific Northern Oil
John Oxford - Koppers Company, Inc.
Bob Ferguson - Rhone-Poulenc
Larry Patterson - Pennwalt Chemical Corp.
Michael Veysey - Gould, Inc.
Janet D. Smith - NL Industries, Inc.

NEIL GOLDSCHMIDT
GOVERNOR

Department of Environmental Quality

811 SW SIXTH AVENUE, PORTLAND, OREGON 97204-1390 PHONE (503) 229-5696

November 30, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Wacker Siltronic Corp.
P.O. Box 03180
Portland, OR 97203

ATTN: Manager of Environmental Affairs

RE: Listing of Wacker - Siltronic Corp
on Inventory of Confirmed Releases
DEQ Site Identification No. 183

This letter is to notify you that the facility located at

7200 N.W. Front, Portland

is hereby proposed for listing on the Department of Environmental Quality (DEQ) Inventory of facilities where a release of hazardous substances has been confirmed. Based on a review of records

Wacker Siltronic Corp.

has been identified as an owner of all or part of the facility. While the Department has identified you as an owner for purposes of the Inventory, this is not a determination as to your responsibility for the release or legal liability.

For the purpose of providing public information, the DEQ is required to develop and maintain an Inventory of all facilities where a release of hazardous substances is confirmed by the Department. The development of the Inventory is directed by Oregon Revised Statutes (ORS) 466.557. The Inventory will be submitted to the Governor, the Legislative Assembly and the Environmental Quality Commission on January 15, 1989 and each year thereafter, as specified in ORS 466.557(5).

Attached to this letter is an order by the Department formally stating our decision to list the facility on the Inventory. The facility will be listed on the Inventory unless you appeal the listing by submitting to me a request for a hearing before the Environmental Quality Commission.

This request for hearing must be submitted within 15 days of receiving this notice letter. Otherwise the facility will be listed on the Inventory. Again, the listing of a facility on the Inventory is not a determination that an owner is responsible for the release nor legally liable. If a timely request for hearing is made, the decision to list the facility on the Inventory will automatically be postponed until final disposition of the appeal.

The Department will attempt to resolve appeals without using a formal contested case hearing. Where this is not possible, a hearing will be scheduled and conducted in accordance with contested case hearing procedures provided for in ORS Chapter 183, as described in the attached order. You may appeal the decision to list the facility on the Inventory if you believe any of the items listed in Section 1. Findings of Fact and Conclusions of Law in the attached order are in error or based on any other factual or legal reasons.

The Inventory is a list of all facilities that have confirmed releases of hazardous substances, regardless of the status of the site. Many sites will need preliminary assessments to determine whether further investigation or cleanup is needed or whether cleanup actions taken previously are adequate. At other sites, investigations or actions have already been taken to address the release. Depending on the status of the site, the Department will determine the appropriate response for each site and schedule follow-up action based on the environmental hazard and available Department resources.

Should you want copies of the state Environmental Cleanup law or Environmental Cleanup rules, please contact Carol Harris at 503-229-6853 or write to:

Environmental Cleanup Division
811 S.W. Sixth Avenue
Portland, Oregon 97204

If you have specific questions about the Inventory or the listing of your facility, please contact the Site Assessment Section of the Environmental Cleanup Division at 503-229-5733.

Sincerely,

Fred Hansen
Director

cc: Northwest Region

DEQ asks companies to test site's 'chemical soup'

11-20-88

By DIANE DULKEN
Correspondent, The Oregonian

The ground water of a Northwest Portland industrial site has been called "chemical soup" by one state official, and the Oregon Department of Environmental Quality has sent letters asking all companies occupying the area to conduct tests to find out the ingredients and potency of the toxic brew.

Water and soil at the 18-acre Doane Lake industrial enclave, which is roughly across the river from the University of Portland campus, is tainted by lead, herbicides and other hazardous wastes, according to a recently released U.S. Environmental Protection Agency report.

Some wastes have drained into the nearby Willamette River, the September EPA report said.

In 1982, the EPA named one of the properties in the Doane Lake area to the Superfund list, a roster of the nation's most severely contaminated sites. The Superfund site, a now-defunct lead-battery recycling plant, is owned by the Illinois-based Gould Inc. and was operated for three decades by a Houston company, NL Industries, and its subsidiary, Morris P. Kirk and Sons.

The EPA has estimated that the cleanup of the NL/Gould site will take more than six years and cost about $20 million. Final design plans for the NL/Gould cleanup began in September and will be completed in June. The actual cleanup will begin soon after and is scheduled to be completed by 1995, according to William Renfroe, DEQ project manager for the site.

But Renfroe said the federal agency recognized that it couldn't clean up the NL/Gould land, which shares the ground water with 11 other companies, without addressing the potpourri of chemicals spilled or disposed of in the vicinity over several decades.

"What we have out there, quite frankly, is chemical soup," Renfroe said.

Under the direction of EPA, the DEQ issued letters Wednesday to nine of the companies occupying the site, requesting that they conduct extensive studies of the area's surface water and ground water, Renfroe said. The letter also requested representatives of all the companies to meet with DEQ officials early next month.

The studies, to be paid for by the companies involved, will be the preliminary step in a long-contemplated cleanup of the area. Under a DEQ-EPA agreement, the state agency will oversee all procedures as long as the businesses cooperate.

The companies have until March 31 to negotiate and sign a consent order with DEQ, Renfroe said. It is not yet known how much the studies will cost, but so far, Renfroe said, all the companies have expressed a willingness to cooperate with the agency.

Renfroe said that until the studies were completed, it would not be possible to say how severe the contamination was or what dangers it might pose to the environment.

Because the Doane Lake area is not near a residential zone, Renfroe said, "it is not an imminent and substantial threat to human health."

He added, however, that "we don't know the long-term effects of this low-level chronic exposure."

Renfroe said that the contamination in the Doane Lake area is believed to have resulted not from negligence or past illegal procedures, but from practices that had been considered standard in previous years.

In addition to Gould, the companies in the area include:

- Koppers Co. It is a giant chemical company with headquarters in Pittsburgh. In Portland, the plant blends creosote, a wood preservative.

Plant manager John Oxford said the plant doesn't generate any wastes and he doesn't believe creosote from the Koppers plant will be found in the ground water.

- Rhone-Poulenc Ag Co. The business, with headquarters in North Carolina, is an offshoot of a giant French chemical company and manufactures the herbicide bromoxynil octanoate in its Portland plant. Until 1982, it had produced 2,4-D and had handled 2,4,5-T, both chemicals found in Agent Orange, the defoliant used in the Vietnam War.

In an interview, plant manager Bob Ferguson said that the company had conducted preliminary ground water studies that showed the presence of chlorophenols, which he said are used in the manufacture of 2,4-D.

- Pennwalt Corp. The Philadelphia-based chemical company makes chlorine, ammonia, caustic soda and other chemicals in Portland.

Pennwalt plant manager Ed Locke said the plant's wastes weren't classified by DEQ as hazardous material. "We don't believe that there is something there (in the water) from our site that would cause a problem," he said.

The other Doane Lake-area companies called upon by DEQ to launch ground water and surface water studies are: ESCO Corp., Liquid Air Corp., Northwest Natural Gas Co., Pacific Northern Oil Co., Schnitzer Investment Corp. and Wacker Siltronics Corp.

Working

M-K ENGINEERS
APR 22 1988
MARKETING

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

IN THE MATTER OF: 20 to 30 acres located in Multnomah County, Oregon, which acreage includes 9.2 acres owned by Gould Inc., at 5909 N.W. 61st Ave., Portland, and formerly owned by NL Industries, Inc., Respondents, Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 [42 U.S.C. §9606(a)].	EPA Docket No. 1085-05-08-106

ADMINISTRATIVE ORDER ON CONSENT

I. JURISDICTION

This Consent Order is issued pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §9606(a), and delegated to the Administrator of the United States Environmental Protection Agency (EPA) on August 14, 1981, by Executive Order 12316, 46 Fed. Reg. 42237, and further delegated to the Assistant Administrator for Solid Waste and Emergency Response and the Regional

Form OBD-183
12-8-76 DOJ

Pl's Ex #2

SCOEPA00011993

Administrators by EPA Delegation Nos. 14-14 and 14-14-A, the latter of which was signed on April 16, 1984.

Respondents Gould Inc. and NL Industries, Inc. agree jointly and severally to undertake the tasks required by this Consent Order.

This Consent Order is issued to Respondents Gould Inc. (Gould) and NL Industries, Inc. (NL). Respondents agree to undertake all actions required by the terms and conditions of this Consent Order. Respondents further consent to and agree not to contest EPA's jurisdiction to issue this Consent Order.

II. STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of EPA and Respondents are to perform a remedial investigation and feasibility study (RI/FS) (1) to determine fully the nature and extent of the threat to the public health or welfare or the environment caused by the release or threatened release of hazardous substances from the site (the remedial investigation), and (2) to evaluate alternatives, including the no-action alternative, for the appropriate extent of remedial action to prevent or mitigate the migration or the release or threatened release of hazardous substances, pollutants, or contaminants from the site (the feasibility study). The purpose of the RI/FS required by this Consent Order is to evaluate any contamination of the Gould site by hazardous substances (specifically lead) released as a result of activities carried out by operators of facilities on the Gould property. Contribution from other sources, if any, would be evaluated

Form OBD-183
12-8-76 DOJ

SCOEPA00011994

in subsequent proceedings related to this site. The prescribed activities conducted pursuant to this Consent Order are subject to approval by EPA and shall be consistent with the National Contingency Plan, 40 CFR Part 300.68 (a)-(j) [47 Federal Register 31180 (July 16, 1982), revised at 48 Federal Register 40658 (September 8, 1983)].

This Consent Order is entered into (a) solely for the purpose of resolving disputed claims among EPA and Respondents and eliminating costly administrative disputes as to such claims, and (b) without any admission by Respondents of any finding of fact or conclusion of law herein or any liability or violation whatsoever, and (c) without any finding of fact relative to whether Respondents have conducted operations at the site in a negligent or otherwise improper manner or in a manner constituting a public or private nuisance.

III. FINDINGS OF FACT

The following constitutes an outline of the information before the Regional Administrator:

A. The Gould site includes the property presently owned by Gould, along with any areas outside the property boundary where battery casings and other residue from operations on the Gould site were placed. Because of the potential for dispersion of contaminants in water, the site also includes the boundaries of Doane Lake in its present and past (1963) configuration (see Appendix A, Figure 1). The Gould site is located in a heavily industrialized area northwest of downtown Portland, approximately 1000 feet southwest

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12-8-76 DOJ

SCOEPA00011995

of the Willamette River. Other sites in this industrialized area are the subject of ongoing environmental investigations.

1. Doane Lake was once a low, swampy area between the Willamette River and hills in the area where the Gould site is located. Filling activities have reduced the lake to three segments. The lake remnant on the Gould property overflows into a catch basin near the northeast corner on the site and a storm sewer carries any overflow to the Willamette River.

2. The Willamette River flows generally north through western Multnomah County to the Columbia River. Anadromous fish along with warm water fish and other aquatic life are found in the river.

3. Two principal aquifers are present beneath the site area--an upper, unconfined body of groundwater in the sandy alluvial deposits which extends approximately 25 to 50 feet below ground surface, and a deeper confined (or semi-confined) aquifer system in the Columbia River basalts at about 300 feet below the ground surface. The alluvial aquifer is recharged primarily by direct infiltration of precipitation. Surface runoff in ditches, leakage from storm drains and sewers, and inflow from Doane Lake and the Willamette River (at times) also contribute recharge to the shallow aquifer. There are no known drinking water, water supply or other production wells that use the alluvial aquifer in the Gould site area. However, there are numerous monitoring wells in the aquifer on and off-site. Groundwater flow is generally north-northeast toward discharge areas along the Willamette River.

Form OBD-183
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SCOEPA00011996

Groundwater in the basalt aquifer system occurs primarily in the permeable interflow zones between adjacent individual basalt flows. The basalt aquifer may be recharged in the Tualatin Mountains to the west, and groundwater movement may be towards the east or northeast. In the general site area, a number of wells penetrate the basalt aquifers to obtain water for various industrial uses. Available well logs do not indicate that any of the wells in the immediate site vicinity are used as a source of drinking water. It is believed that there is no interconnection between the shallow alluvial aquifer and the deeper basalt aquifer.

B. Gould, a manufacturer of electronic systems with its headquarters in Rolling Meadows, Illinois, presently owns and formerly operated the battery recycling facility in Portland, Oregon on the Gould site. Doane Lake occupies approximately one-third of the Gould property. The remaining two-thirds is paved, and includes two office buildings and numerous mounds of battery casings.

C. Battery recycling operations began on the Gould property about 1949. The property was owned and operated by Morris P. Kirk & Son, Inc. (Kirk). NL, a New Jersey corporation, owned a majority of the outstanding shares of Kirk's stock until 1972, when NL acquired all the shares. NL manufactures oil field equipment, drilling muds and fluids, provides oil field services and manufactures inorganic chemicals. NL's corporate headquarters is located at 1230 Avenue of the Americas, New York, New York 10020. Kirk and NL operated a secondary lead smelter with refining kettles, casting facilities and a lead oxide production facility during their period

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of ownership. Gould bought the site from Respondent NL in January 1979. Gould suspended battery recycling operations in October 1979; terminated lead refining operation in January 1980; and, terminated the lead oxide process in May 1981. Gould continued to process accumulated inventory until August 1981. A RCRA Part A permit was withdrawn on August 16, 1982 because the facility ceased operation in August 1981.

D. During the period that NL owned the site, it operated a smelter which was primarily used in the smelting of lead bearing scrap and used batteries. NL asserts: (1) that the secondary lead smelter operations were based on a tolling arrangement; (2) that entities, including among others, Globe Union, Inc., P.O. Box 591, Milwaukee, Wisconsin, 53201, would deliver batteries to the site; (3) that NL would process and refine the scrap materials at its facility; and (4) that NL would thereafter return the refined materials to the tolling companies. Similarly, Gould asserts that the battery recycling, lead refining and lead oxide process operations it conducted were based on tolling agreements with various companies which would deliver scrap batteries to the site.

E. The State of Oregon Department of Environmental Quality (DEQ) issued a Notice of Violation and Intent to Assess Civil Penalties to Gould in July 1981 for discharging wastewater into Doane Lake without a permit and for lead oxide dust emissions. During the site inspection DEQ found total lead concentration of 285 mg/l in the wastewater. This exceeded EPA and DEQ Willamette Basin ambient water quality standards for lead (0.05 mg/l). In

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April 1981, DEQ sampled surface water, sediment from the pond and yard material at the site. All samples showed lead contamination (see tables 1-4 in Appendix A). The yard material samples had concentrations of lead ranging from 19 to 450,000 ppm. DEQ also monitored airborne particulates from June through September 1981. Airborne lead concentrations exceeded both DEQ (3.0 ug/m^3 monthly average) and EPA (1.5 ug/m^3 quarterly average) ambient air standards (see Table 4 Appendix A). During this sampling period Gould was involved in site activities which may have contributed to the unusually high lead particulate values observed during this period. Gould performed groundwater monitoring at wells located on the site in March 1982. Total lead concentrations ranged from 0.04 mg/l to 0.29 mg/l. The EPA standard is 0.05 mg/l lead for primary drinking water.

F. In accordance with section 105 of CERCLA 42 U.S.C. §9605 the Gould site was included on the National Priorities List in September 1983.

G. Hazardous materials, particularly lead, from the Gould site may affect human health and other biological ecosystems by surface water, groundwater and air pathways.

1. Surface water runoff may transport contaminants deposited on the ground or leached from battery casings to Doane Lake. If Doane Lake overflows, any contaminants may be transported to the Willamette River through the storm drain.

2. Contaminants could enter the groundwater pathways by percolation of contaminated surface water, and by leaching

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from buried battery casings and contaminated soil. The groundwater could also transport contaminants to the Willamette River.

3. Contaminants transported by fugitive dust emissions from the battery casing pile or loose soil could be deposited on plants, buildings, and the ground offsite.

H. The terrestrial and aquatic organisms and human population in nearby residential areas, in the Willamette River, and in the surrounding industrial area would be the possible receptors of hazardous materials migrating offsite.

1. Lead in sufficiently high concentrations causes chronic toxicity in freshwater aquatic life. Also, lead may bioaccumulate in the food chain.

2. Lead compounds may affect humans in a variety of ways, depending on the route of exposure (air, water, food), the concentration of lead and its chemical form. At the Gould site the primary route of exposure is air due to fugitive dust emissions. The concentrations of lead inhaled by humans will depend on climatic conditions, particle size, and the proximity of the individuals to the site. The smaller particulates are respirable into the deep lung, while much of any inhaled larger dust particles can also be ultimately swallowed with mucus from the nasopharynx. Lead oxide particles have been observed at very high concentrations in yard materials (211,000 ppm), and low concentrations in the soil (32 ppm). Persons working on or in close proximity to the site may thus experience acute lead exposures, which would logically result in their absorbing high concentrations of lead. At the very high

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concentrations mentioned previously at the site, lead which is inhaled or ingested and subsequently absorbed by humans would clearly result in elevated blood lead levels. Bioaccumulation of lead is a cumulative process which occurs throughout one's lifetime, with about ninety percent of the body burden residing ultimately in bone. This body burden will logically be increased very significantly in persons having acute and/or chronic exposure to fugitive dust emissions from the site, resulting in the possibility of their health being compromised accordingly.

I. During the period from October 1982 until January 1985, Gould has been cooperating with the State of Oregon in an effort to recycle battery casings remaining at the site. With the closing of this operation, Gould agreed to examine remedial action alternatives with EPA.

IV. CONCLUSIONS OF LAW

A. The site where Gould and NL performed the battery recycling operation is defined as a "facility" pursuant to 42 U.S.C. §9601(9).

B. The named respondents are defined as "persons" pursuant to 42 U.S.C. §9601(21).

C. Lead is a "hazardous substance" pursuant to 42 U.S.C. §9601(14).

D. Lead in non-naturally occurring circumstances has been found in the soil, sediment and other media at the Gould site. Therefore, lead has been "released" [as defined in 42 U.S.C. §9601(22)] into the environment of the site.

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E. Respondent Gould is the owner and former operator of the facility, and is subject to liability pursuant to 42 U.S.C. §9607(a)(1). Respondent NL is the former owner and operator of the facility and is also subject to liability pursuant to 42 U.S.C. §9607(a)(1).

V. DETERMINATIONS

A. On the basis of the findings from the Gould site investigation and all other information available, the Regional Administrator of EPA has determined that (pursuant to section 106 of CERCLA, 42 U.S.C. §9606) there may be an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the site herein described.

B. Under Section 106 of CERCLA, 42 U.S.C. §9606, the Regional Administrator has been delegated the authority to issue orders to secure such relief as may be necessary to protect the public health or welfare and the environment.

VI. WORK TO BE PERFORMED

Respondents shall perform work at the site and in the vicinity of the site in accordance with the Work Plan Protocol which will be deemed incorporated by reference into this Consent Order upon approval by EPA and annexed hereto as Attachment 1.

All site work performed by the Respondents pursuant to this Consent Order shall be under the direction and supervision of a person with expertise in hazardous waste site cleanup and shall

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be consistent with the National Contingency Plan, 40 C.F.R. 300.68. Prior to the initiation of site work, the Respondents shall notify EPA in writing regarding the name, title, and qualifications of such person and of any contractors and/or subcontractors to be used in carrying out the terms of this Consent Order. If EPA disapproves of any such person and so notifies Respondents, that person thereafter does not meet the requirements of the second sentence of paragraph VI.

Based on the foregoing, it is hereby ORDERED that the following work shall be performed:

A. Within ninety (90) calendar days of the effective date of this Consent Order, Respondents shall submit to EPA a draft plan for a complete Remedial Investigation and Feasibility Study, (RI/FS Work Plan). This plan shall be developed in accordance with the EPA Remedial Investigation and Feasibility Study guidance documents which have been provided to the Respondents by EPA. As described in this guidance, the RI/FS Work Plan must include but should not be limited to: (1) a health and safety plan, (2) a sampling and quality assurance plan which will follow procedures set forth in EPA document QAMS-005/80, (3) a scope of work describing tasks to be performed in accordance with Attachment 1, and (4) a schedule for completion of each task. (Note that EPA will prepare the community relations plan in accordance with EPA guidance, and will provide a copy of the community relations plan to Respondents for review prior to its implementation, but EPA retains sole responsibility for its content.) The RI/FS Work Plan shall be subject to review and approval by EPA.

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B. Not later than sixty (60) days after receipt of the draft RI/FS Work Plan, EPA shall notify the Respondents in writing of EPA's approval or disapproval of the draft RI/FS Work Plan or any part thereof. In the event of any disapproval, EPA shall specify in writing both the deficiencies and any EPA recommended modifications regarding the draft RI/FS Work Plan.

C. Within thirty (30) calendar days of the receipt of EPA notification of draft RI/FS Work Plan disapproval, Respondents shall amend and submit to EPA a revised draft RI/FS Work Plan. In the event of subsequent disapproval of the draft RI/FS Work Plan, EPA retains the right to conduct a complete RI/FS pursuant to its authority under CERCLA.

D. Within thirty (30) calendar days of the receipt of EPA notification of the approval of the draft RI/FS Work Plan, Respondents shall submit to EPA a final RI/FS Work Plan. Upon approval, the final Work Plan will be attached and incorporated by reference into this Order on Consent (Attachment 2).

E. Respondents shall implement the tasks detailed in the EPA approved RI/FS Work Plan. This work shall be conducted in accordance with the EPA Remedial Investigation and Feasibility Study guidance documents and with the standards, specifications, and schedule contained in the RI/FS Work Plan.

F. Within thirty (30) calendar days of receipt of notice of EPA approval of the final RI/FS Work Plan, Respondents shall commence implementation of the tasks identified therein.

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G. Respondents shall provide monthly written progress reports to EPA in accordance with the RI/FS Work Plan. At a minimum these progress reports shall contain: (1) a concise summary of the elements of the RI/FS Work Plan that were performed during the month; (2) copies of all available analytical results; and (3) a concise summary of the elements of the RI/FS Work Plan that Respondents plan to perform during the following month. The initial progress report shall be submitted to EPA by the tenth day of the second month following the date on which Respondents receive notice that EPA has approved the RI/FS Work Plan.

H. Respondents shall provide preliminary and final reports to EPA according to the schedule contained in the RI/FS Work Plan.

I. EPA shall review the preliminary and final reports and within 30 calendar days of receipt by EPA of such report, EPA shall notify Respondents in writing of EPA's approval or disapproval of these reports or any part thereof. In the event of any disapproval, EPA shall specify in writing both the deficiencies and reasons for such disapproval.

J. Within 30 calendar days of receipt of EPA notification of preliminary or final report disapproval, the Respondent shall amend and submit to EPA such revised reports. In the event of disapproval, EPA retains the right to provide supplementary reports, to perform additional studies, and to conduct a complete Remedial Investigation and Feasibility Study pursuant to its authority under CERCLA.

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K. EPA may determine that tasks, including remedial investigatory work and/or engineering evaluation, are necessary as part of the Remedial Investigation and Feasibility Study in addition to EPA approved tasks and deliverables including reports, which have been completed pursuant to this Consent Order. Subject to the "Dispute Resolution" Section (Section XII) of this Consent Order and the requirements of CERCLA and the National Contingency Plan (NCP); (40 C.F.R. Part 300 et seq., 47 Federal Register 31180, July 16, 1982), Respondents shall implement any additional tasks which EPA determines are necessary as part of a Remedial Investigation and Feasibility Study and which are in addition to the tasks detailed in the RI/FS Work Plan. The additional work shall be completed in accordance with the standards, specifications, and schedule determined or approved by EPA.

VII. DESIGNATED PROJECT COORDINATORS

A. On or before the effective date of this Consent Order, EPA and Respondents shall each designate a Project Coordinator. Each Project Coordinator shall be responsible for overseeing the implementation of this Consent Order. The EPA Project Coordinator will be EPA's designated representative. To the maximum extent possible, communications between Respondents and EPA and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Consent Order, shall be directed through the Project Coordinators.

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B. EPA and the Respondents each have the right to change their respective Project Coordinator. Such a change shall be accomplished by notifying the other party in writing at least five (5) calendar days prior to the change.

C. The EPA designated "On-Scene-Coordinator", who may be the EPA Project Coordinator, shall have the authority vested in the On-Scene Coordinator by the NCP. This includes the authority to halt, conduct, or direct any tasks required by this Consent Order and/or any response actions or portions thereof when conditions present an immediate risk to public health or welfare of the environment. The EPA's Project Coordinator shall have the authority to make or authorize minor field modifications in the work performed pursuant to this Consent Order, so long as such changes are not inconsistent with the explicit terms of this Consent Order.

D. The absence of the EPA Project Coordinator or OSC from the site shall not operate as an excuse for delay or for stopping work.

VIII. QUALITY ASSURANCE

A. Respondents shall use quality assurance, quality control, and chain of custody procedures in accordance with EPA document QAMS-005/80, throughout all sample collection and analysis activities. The Respondent shall consult with EPA in planning for, and prior to, all sampling and analysis as detailed in the RI/FS Work Plan. In order to provide quality assurance and maintain quality control regarding all samples collected pursuant to this Consent Order, the Respondent shall:

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1. Ensure that EPA personnel and/or EPA authorized representatives are allowed and provided access to the laboratory(s), and personnel utilized by Respondents for analyses.

2. Ensure that the laboratory(s) utilized by Respondents for analyses perform such analyses according to EPA methods or methods deemed satisfactory to EPA and submit all protocols to be used for analyses to EPA at least two weeks prior to the commencement of analyses.

3. Ensure that laboratory(s) utilized by Respondents for analyses participate in an EPA quality assurance/quality control program equivalent to that which is followed by EPA and which is consistent with EPA document QAMS-005/80. As part of such a program and upon request by EPA, such laboratory(s) shall perform analyses of samples provided by EPA to demonstrate the quality of each laboratory's analytical data.

IX. SITE ACCESS

To the extent that the site includes property owned by parties other than those bound by this Consent Order, Respondents have obtained or will use their best efforts to obtain site access agreements from the present owners within 30 calendar days of the effective date of this Consent Order. Such agreements shall provid reasonable access to EPA and/or its authorized representatives. In the event that site access agreements are not obtained within the time referenced above, Respondents shall notify EPA regarding both the lack of, and efforts to obtain, such agreements within 30 calendar days of the effective date of this Consent Order. Inabili

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to gain needed site access shall be justification for delay in accordance with the Force Majeure provision at Section XIV, infra.

X. SAMPLING, ACCESS, AND DATA/DOCUMENT AVAILABILITY

A. Respondents shall make the results of all sampling and/or tests or other data generated by Respondents, or on the Respondents' behalf, with respect to the implementation of this Consent Order, available to EPA and shall submit these results in monthly progress reports as described in Section VI of this Consent Order. EPA will make available to Respondents the results of sampling and/or tests or other data generated by EPA for the area within or adjacent to the site.

B. At the request of EPA, Respondents shall allow split or duplicate samples to be taken by EPA and/or its authorized representatives, of any samples collected by Respondents pursuant to the implementation of this Order. Respondents shall notify EPA not less than one (1) week (seven calendar days) in advance of any sample collection activity.

C. EPA and/or any EPA authorized representative shall at least have the authority to enter and freely move about all the Gould property at the site at reasonable times for the purposes of, inter alia: inspecting records, operating logs, and contracts related to the site; reviewing the progress of Respondents in carrying out the terms of this Consent Order; conducting such tests as EPA or the Project Coordinator deem necessary; using a camera, sound recording, or other documentary type equipment; and verifying the data submitted to EPA by Respondents. Respondents shall permit

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such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, in any way pertaining to work undertaken pursuant to this Consent Order. All EPA employees and any EPA authorized contractors with access to the site pursuant to this paragraph shall comply with all approved health and safety plans.

D. Respondents may assert a genuine confidentiality claim, if appropriate, covering part or all of the information requested by this Consent Order pursuant to 40 C.F.R. § 2.203(b). Such an assertion shall be adequately substantiated when the assertion is made. Analytical data shall not be claimed as confidential by Respondents. Information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when it is submitted to EPA, it may be made available to the public by EPA without further notice to Respondents.

XI. RECORD PRESERVATION

A. Respondents agree that they shall preserve during the pendency of this Consent Order and for a minimum of six (6) years after its termination, all records and documents in their possession or in the possession of their employees, agents, accountants, contractors, or attorneys which are not legally privileged, and which relate in any way to the site, despite any document retention policy to the contrary. If EPA desires to have the records retained beyond the six year period, it shall notify Respondents in writing thirty (30) days prior to the end of the six year period. Respondent

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will transmit the records to EPA if so requested. Except as outlined above, Respondents shall have no obligation to retain the records beyond the six year period.

XII. DISPUTE RESOLUTION

A. If Respondents object to any EPA notice of disapproval or decision made pursuant to this Consent Order, Respondents shall notify EPA in writing of its objections within fourteen (14) days of receipt of the decision. EPA and Respondents then have an additional fourteen (14) days from the receipt by EPA of the notification of objection to reach agreement. If agreement cannot be reached on any issue within this fourteen (14) day period, EPA shall promptly provide a written statement of its decision to Respondents, which shall be deemed a final Agency action for purpose of judicial review. During the pendency of a dispute and until the EPA provides a written statement of its decision, stipulated penalties imposed by this Consent Order, as set forth in Section XII shall be stayed.

XIII. DELAY IN PERFORMANCE/STIPULATED PENALTIES

A. For each week (7 days) that Respondents fail to submit a report or document or otherwise fail to achieve the requirements of this Consent Order, EPA may require that Respondents pay into the United States Treasury, the sums set forth below as stipulated penalties. Check should be addressed to: Region 10 Hearing Clerk, U.S. Environmental Protection Agency, Superfund Accounting, P.O. Box 371003M, Pittsburgh, Pennsylvania 45251.

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B. Stipulated penalties shall accrue in the amount of:

1. Failure to submit draft or final RI/FS Work Plan per agreed-upon schedule: $100.00 for the first week or any fraction thereof, and $500.00 for each week thereafter.

2. Failure to commence work prescribed in EPA approved RI/FS Work Plan per agreed-upon schedule: $100.00 for the first week or any fraction thereof, and $500.00 for each week thereafter.

3. Failure to submit the preliminary RI/FS per agreed-upon schedule: $100.00 for the first week or any fraction thereof and $500.00 for each week thereafter.

4. Failure to submit the final RI/FS report per the agreed-upon schedule: $100.00 for the first week or any fraction thereof, and $500.00 for each week thereafter.

C. The stipulated penalties set forth in this Section do not preclude EPA from electing to pursue any other remedies or sanctions which may be available to EPA by reason of the Respondents' failure to comply with any of the requirements of this Consent Order. Such remedies and sanctions include a suit for statutory penalties as authorized by Section 106 of CERCLA, a federally-funded response action, and a suit for reimbursement of costs incurred by the United States.

XIV. FORCE MAJEURE

A. If any event occurs which causes delay and effectively precludes compliance with the terms of this Order, Respondents shall promptly notify EPA orally and shall, within seven (7) days of oral

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notification to the Agency, notify EPA in writing of the anticipated length and cause of the delay, the measures taken and to be taken by Respondents to prevent or minimize the delay, and the timetable by which the Respondents intend to implement these measures. If Respondents demonstrate that the delay or anticipated delay has been or will be caused by circumstances beyond their reasonable control and despite the due diligence of the Respondents, the time for performance hereunder shall be excused or extended for a period equal to the delay resulting from such circumstances and any such delay shall not be deemed a violation of this Consent Order. However neither increased costs of performance of the terms and conditions of the Consent Order nor changed economic circumstances may be considered circumstances beyond the reasonable control of Respondents

XV. RESERVATION OF RIGHTS

A. Notwithstanding compliance with the terms of this Consent Order, including the completion of the EPA approved Remedial Investigation and Feasibility Study, Respondents are not released from liability, if any, for any actions beyond the terms of this Consent Order taken by EPA respecting the site. EPA reserves the right to take any enforcement action pursuant to CERCLA and/or any available legal authority, including the right to seek injunctive relief, monetary penalties, and punitive damages for any violation of law or this Consent Order.

B. Respondents and EPA expressly reserve all rights and defenses that they may have, except the right to challenge EPA's jurisdiction regarding this Consent Order, including EPA's right

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both to disapprove of work performed by Respondents and to request that Respondents perform tasks in addition to those detailed in the RI/FS Work Plan, as provided in this Consent Order. In the event that Respondents decline to perform any additional and/or modified tasks, EPA will have the right to undertake any remedial investigation and/or feasibility study work. In addition, EPA reserves the right to undertake removal actions and/or remedial actions at any time as authorized by CERCLA or any other law. In either event, EPA reserves the right to seek reimbursement from the Respondents thereafter for such costs incurred by the United States.

XVI. REIMBURSEMENT OF COSTS

A. At the end of each fiscal year, EPA shall submit to the Respondents an accounting of all response and oversight costs incurred by the U.S. Government with respect to this Consent Order. Subject to Section XII Dispute Resolution and such rights as EPA may have by law, Respondents shall, within 60 calendar days of receipt of that accounting, remit a check for the amount of those costs made made payable to the Hazardous Substance Response Trust Fund. Checks should specifically reference the identity of the site and be addressed to:

U.S. Environmental Protection Agency
Superfund Accounting
P.O. Box 371003M
Pittsburgh, PA 15251
Attention: Region 10 Hearing Clerk

(A copy of the transmittal letter should be sent to the Project Coordinator.)

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B. EPA reserves the right to bring an action against Respondents pursuant to Section 107 of CERCLA for recovery of all response and oversight costs incurred by the United States related to this Consent Order and not reimbursed by Respondents, as well as any other past and future costs incurred by the United States in connection with response activities conducted pursuant to CERCLA at this site.

XVII. OTHER CLAIMS

A. Nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation not a signatory to this Consent Order for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken from the site.

B. This Consent Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA.

XVIII. OTHER APPLICABLE LAWS

A. All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable local, state, and federal laws and regulations unless an exemption from such requirements is specifically provided in this Consent Order.

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XIX. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

A. Respondents agree to indemnify and save and hold the United States Government, its agencies, departments, agents, and employees, harmless from any and all claims or causes of action arising from or on account of acts or omissions of Respondents, their officers, employees, receivers, trustees, agents, or assigns, in carrying out the activities pursuant to this Consent Order. EPA shall notify Respondents of any such claim or action and allow Respondents the opportunity to participate in any claim or action for which Respondents have agreed to indemnify and save and hold EPA harmless. EPA is not a party to any contract involving Respondents concerning activities at or for the site.

XX. PUBLIC COMMENT

A. Upon submittal to EPA of an approved Feasibility Study Final Report, EPA shall make both the Remedial Investigation Final Report and the Feasibility Study Final Report available to the public for review and comment for, at a minimum, a twenty-one (21) day period, pursuant to EPA's Community Relations Policy. Following the public review and comment period, EPA shall notify Respondents which remedial action or initial remedial measure alternative is approved for the site.

XXI. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

A. In consideration of the numerous communications between Respondents and EPA prior to the issuance of this Consent Order, Respondents agree that there is no need for a settlement

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conference prior to the effective date of this Consent Order. Therefore, the effective date of this Consent Order shall be the date on which it is signed by EPA.

B. This Consent Order may be amended by mutual agreement of EPA and Respondents. Such amendments shall be in writing and shall have as the effective date, that date on which such amendments are signed by EPA.

C. Any reports, plans, specifications, schedules, and attachments required by this Consent Order are, upon approval by EPA, incorporated into this Consent Order. Any material non-compliance with such EPA approved reports, plans, specifications, schedules, and attachments shall be considered a failure to achieve the requirements of this Consent Order and will subject Respondents to the provisions included in the "Delay in Performance/Stipulated Penalties" Section (Section XIII) of this Consent Order.

D. No informal advice, guidance, suggestions, or comment by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by Respondents will be construed as relievin Respondents of their obligation to obtain such formal approval as may be required by this Consent Order.

XXII. PARTIES BOUND

A. This Consent Order shall apply to and be binding upon Respondents and EPA, their agents, successors, and assigns.

B. No change in ownership status relating to the site will in any way alter the status of Respondents or in any way alter Respondents' responsibility under this Consent Order. Respondents

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will remain the Respondents under this Consent Order and will be responsible for carrying out all activities required of Respondents under this Consent Order.

C. Respondents shall provide a copy of this Consent Order to all contractors, sub-contractors, laboratories, and consultants retained to conduct any portion of the work performed pursuant to this Consent Order within fourteen (14) calendar days of the effective date of this Consent Order.

XXIII. NOTICE TO THE STATE

A. EPA has notified the State of Oregon pursuant to the requirements of Section 106(a) of CERCLA.

XXIV. COMPLETION AND SATISFACTION

A. The provisions of this Consent Order shall be deemed satisfied upon Respondents' receipt of written notice from EPA that Respondents have demonstrated, to the satisfaction of EPA, that all of the terms of this Consent Order, including any additional tasks which EPA has determined to be necessary, have been completed. To the extent that Respondents successfully satisfy this Consent Order, EPA shall issue a written statement that the work was performed in a manner consistent with the National Contingency Plan, and that the provisions of this Consent Order (except for Sections XI, Record Preservation; XIII, Stipulated Penalties; XVII, Other Claims; and XXII, Parties Bound) shall be deemed satisfied.

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XXV. NOTIFICATION

Unless otherwise specified, all documents submitted pursuant to this Order shall be sent by certified mail, return receipt requested or shall be hand delivered to:

Patricia C. Storm
U.S. Environmental Protection Agency
Mail Stop 525
1200 Sixth Avenue
Seattle, Washington 98101

BY THEIR SIGNATURES HEREON, THE UNDERSIGNED REPRESENT THAT THEY HAVE AUTHORITY TO BIND THE PARTIES THEY REPRESENT, THEIR AGENTS, CONTRACTORS, AND SUBSIDIARIES.

IT IS SO AGREED AND ORDERED on this 28th day of August, 1985.

By: R. A. Williams III Sr. V.P.
GOULD INC.

Glen Kauffhold
NL INDUSTRIES, INC.
VICE PRESIDENT

Charles Findley
U.S. ENVIRONMENTAL PROTECTION AGENCY

Effective Date: August 28, 1985

TABLE 1a[1/]

SUMMARY OF RESULTS FOR SURFACE WATER ANALYSES
GOULD, INC.
PORTLAND, OREGON

Sample Date	Sample Location	Contaminant: Total Lead (mg/l)	Zinc (mg/l)	Iron (mg/l)	pH
11/6/79[a]	SW1	1.18	0.4	1.0	5.5
4/3/81[a]	SW2	0.71	-	-	-
4/3/81[a]	SW3	0.32	-	-	-
2/10/83[a]	pond outfall	ND			
3/84[a]	pond	LD0.01			
		LD0.01			
		LD0.01			
		LD0.01			
		0.1			
		0.13			
4/13/84[a]	SW1	0.14			

ND=Not Detected
LD=Less Than Limit of Detection
[a]Sampled by DEQ
[1/]Modified from CH2M Hill, "Remedial Action Master Plan, Gould Inc., Portland, Oregon", November 4, 1983

TABLE 1b[1/]

SUMMARY OF RESULTS FOR RUNOFF WATER ANALYSES
GOULD INC.
PORTLAND, OREGON

		Contaminant			
Sample Date	Sample Location	Lead (mg/l)	Zinc (mg/l)	Iron (mg/l)	pH
4/3/81[a]	Puddle near Hammermill	7.3	-	-	-
4/3/81[a]	Runoff wash-water from Hammermill	285			

[a]Sampled by DEQ
[1/]Modified from CH2M Hill, "Remedial Action Master Plan, Gould Inc., Portland, Oregon", November 4, 1983

TABLE 2 1/

SUMMARY OF RESULTS FOR SOIL AND YARD MATERIALS ANALYSES
GOULD INC.
PORTLAND, OREGON

		Contaminant		
Date	Location	Total Lead ug/g	Sulfate ug/g	pH
4/3/81[a]	Battery mud at SW corner of warehouse.	263,000[c]	-	-
4/3/81[a]	Battery mud near saw	184,000[c]	-	-
4/3/81[a]	Yard cleanup near hammermill	97,700[c]	-	-
4/28/81[a]	Yard cleanup	65,000[d]	-	-
4/28/81[a]	Yard cleanup	450,000[d]	-	-
1/27/82[b]	W1 boring, 4.5' depth	19[d]	83[d]	6.5
1/27/82[b]	W1 boring, 15.5'depth	66[d]	120[d] 130[d]	6.1
1/22/82[b]	W2 boring, 28' depth	15[d]	450[d]	5.4
1/28/82[b]	W3 boring, 4.5' depth	22[d]	14[d] 18[d]	8.6
1/28/82[b]	W3 boring, 10.5' depth	38[d] 37[d]	110[d]	9.4
2/1/82[b]	W4 boring, 20.5' depth	30	440	8.7

ND = Not detectable.
LD=Less than limit of Detection
[a]Sampled by DEQ.
[b]Sampled by Dames and Moore
[c]Reported on dry weight basis.
[d]Reported on wet weight or as-received basis.
1/Excerpt from CH2M Hill, "Remedial Action Master Plan, Gould Inc. Portland, Oregon", November 4, 1983

TABLE 3[1/]

SUMMARY OF RESULTS FOR GROUNDWATER ANALYSES
GOULD INC.
PORTLAND, OREGON

Sample Date	Sample Location	Contaminant: Total Lead mg/l	Dissolved Lead mg/l	Sulfate mg/l	pH
1/82[e]	W1-W4	ND			
	W6-W10	ND			
	W5	70			
	W8	10			
	PP3	ND			
	PP6	ND			
	PP8	76.9			
	PP11	ND			
3/23-24/82[a]	W1	0.15		ND	6.7
3/23-24/82[a]	W2	0.29		6150	6.0
3/23-24/82[a]	W3	0.04		1810	6.6
3/23-24/82[a]	W4	0.26		38	8.2
6/30/82[a]	W1	0.026			8.0
6/30/82[a]	P2	7.7		1060	3.3
6/30/82[a]	P4	0.078		330	9.7
6/30/82[a]	W3	0.076		2010	6.3
7/6/82[a]	W1	0.026		24	8.0
	W3	0.076		2010	6.3
	P2	7.7		1060	3.3
	P4	0.078		330	9.7
10/7/82[a]	W1	0.041		20	6.3
10/7/82[a]	W2	0.21		15400	5.6
10/7/82[a]	W3	0.007		3910	6.1
10/7/82[a]	W4	0.022		3	6.9
10/8/82[a]	W4	0.021		2	7.0
3/15/83[b]	W7	1.5	1.0	-	-
3/15/83[b]	P6	4.9	0.1	-	-
4/6/83[b]	W2	0.6	0.159	-	-
4/6/83[b]	P2	2.4	0.122	-	-
6/10/83[b]	W7	0.5	0.3	-	-
6/23/83[b]	Liq. Air Well	LDO.1	LDO.1	-	-

TABLE 3[1/] (continued)

Sample Date	Sample Location	Total Lead mg/l	Contaminant Dissolved Lead mg/l	Sulfate mg/l	Ph
12/1/83[b]	W1	0.99	LD0.01	-	-
12/1/83[b]	P2	2.72	1.59	-	-
12/1/83[b]	Liq. Air Well	LD0.01	LD0.01	-	-
4/13/84[b]	Liq. Air Well	LD0.01		-	-

LD=Less Than Limit of Detection
ND = Not detectable.
[a]Sampled by Dames and Moore
[b]Sampled by DEQ
[1/]Modified from CH2M Hill, "Remedial Action Master Plan, Gould Inc. Portland, Oregon", November 4, 1983

TABLE 4 1/

SUMMARY OF RESULTS FOR AMBIENT AIR ANALYSES
LEAD IN MICROGRAMS PER CUBIC METER (ug/m^3)
GOULD INC.
PORTLAND, OREGON

Sample Date	Air Monitoring Station AQ1	AQ2	AQ3
6/15/81[a]	0.49	3.6	3.1
6/21/81[a]	0.29	1.43	0.16
6/27/81[a]	0.66	0.51	0.77
Average for 6/81	0.48	1.8	1.3
7/3/81[a]	0.79	0.30	0.51
7/9/81[a]	1.37	9.4	2.54
7/15/81[a]	13.2	1.58	3.4
7/21/81[a]	1.50	1.15	5.7
7/27/81[a]	15.5	1.22	2.54
Average for 7/81	6.5	2.7	2.9
8/2/81[a]	2.28	0.58	1.02
8/8/81[a]	15.3	1.94	1.79
8/14/81[a]	1.26	0.80	2.34
8/20/81[a]	0.75	1.93	0.87
8/26/81[a]	-	2.89	0.85
Average for 8/81	4.9	1.6	1.4
Quarterly average for 6/81 to 8/81	4.0	2.0	1.9
9/1/81[a]	-	0.87	0.44
9/3/81[a]	3.5	-	-
9/7/81[a]	0.55	1.32	0.48
9/13/81[a]	0.58	0.36	0.56
9/19/81[a]	2.09	0.39	0.28
9/25/81[a]	0.37	3.2	0.37
Average for 9/81	1.4	1.2	0.43
8/20/82[b]	0.26	0.38	0.28
8/21/82[b]	0.26	0.39	1.06
8/22/82[b]	0.38	0.40	1.60
8/23/82[b]	0.39	0.41	0.47
Average for 8/82	0.32	0.40	0.85

Table 4 [1/] (continued)

Sample Date	Air Monitoring Station G-2	G-5	G-6(pile)
1982[c]	4.4	11.7	150
9/82[c]	0.18	3.2	144

[a]Sampling done by DEQ
[b]Sampling done by Dames and Moore
[c]Sampling done by EPA
[1/]Excerpt from CH2M Hill, "Remedial Action Master Plan, Gould Inc., Portland, Oregon", November 4, 1983

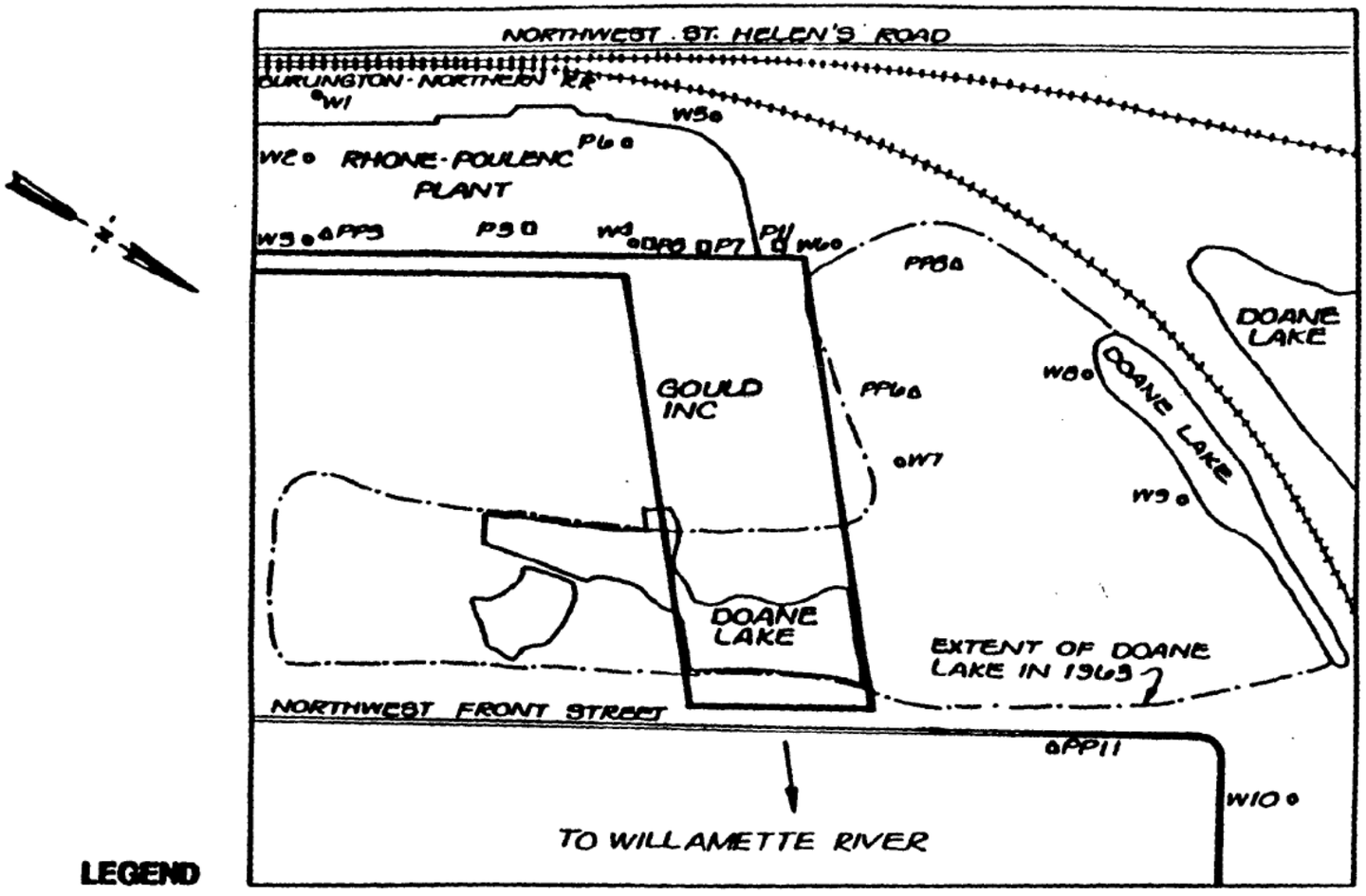
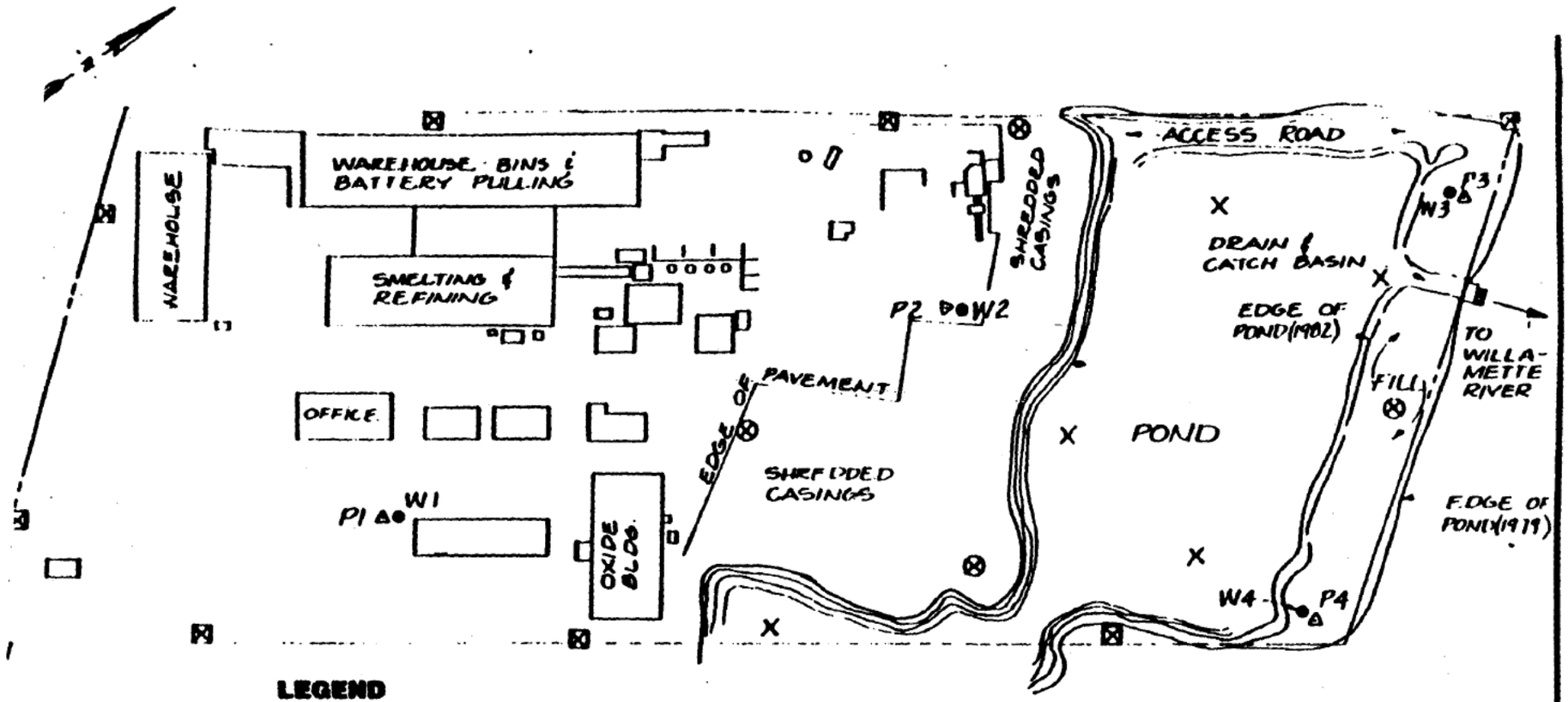


Figure 1[1/]
Locations of Monitoring Wells and Piezometers
Gould Ramp

[1/] Excerpt from CH2M Hill, "Remedial Action Master Plan, Gould Inc. Portland, Oregon", November 4, 1983



LEGEND

- ● EXISTING DEEP MONITORING WELL
- △ EXISTING SHALLOW MONITORING PIEZOMETER
- ⊗ RECOMMENDED MONITORING WELL LOCATION
- ⊠ RECOMMENDED SOIL SAMPLING LOCATION
- X RECOMMENDED LAKE SEDIMENT SAMPLING LOCATION

NOTE: MOST ONSITE BUILDINGS HAVE BEEN REMOVED

50 0 50 100
SCALE IN FEET

Figure 2[1/]
Previous Monitoring and Sampling Locations
Gould Ramp

CH2M HILL

[1/] Excerpt from CH2M Hill, "Remedial Action Master Plan, Gould Inc. Portland, Oregon ", November 4, 1983

WACKER
Wacker Siltronic Corporation

To: File

From: Tom McCue

Subject: PRP List

Date: July 7, 1999

Portland Development Commissions, City of Portland

Northwest Natural Gas Company, Northwest Natural

Portland Gas and Coke / Northwest Natural

Rohne-Poulenc / Chapman Chemical

Port of Portland, Corp of Engineers

US Government Moorings, Operations, Portland Engineering District, Army Corp of Engineers

Western Transportation

Shell Oil Company

Victor Rosenfeld & H.A. Anderson

Gilbert Schnitzer

Koppers

Gould Battery

Olympic Pipeline