An evaluation of the ecological impact of long-term chronic exposure of the biota of Honey Creek to 1,4-dioxane

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I. SUMMARY

This report summarizes the field investigation portion of a comprehensive environmental study of the Honey Creek watershed conducted on behalf of Gelman Sciences, Inc. (GSI). This field investigation, and the laboratory investigations to be reported on in the near future, were undertaken to define the environmental characteristics of the Honey Creek watershed and to assess whether the chronic exposure of Honey Creek to 1,4-dioxane has resulted in any observable abnormalities in the biota of the stream. Field work was jointly performed by Braithwaite Consultants, Inc. (BCI), Ann Arbor Technical Services (ATS), and Drs. Michael Wiley and James Diana of the School of Natural Resources at the University of Michigan. Laboratory services were provided by ATS.

1,4-dioxane is a widely used organic solvent which is both toxic and an animal carcinogen at high concentrations. The behavior and significance of dioxane in the aquatic environments is poorly understood; until recently there has been little evidence of environmental contamination despite widespread use in a multitude of manufacturing processes. The discovery of accidental contamination of groundwater aquifers in the vicinity of Ann Arbor, Washtenaw Co. Michigan, and subsequent contamination of groundwater-fed Honey Creek which drains that general region, raised, possibly for the first time, interest in the effects of dioxane on the biological integrity of surface water ecosystems. More recent data indicate that 1,4-dioxane is a significant impurity in various foods, food additives, comestics and ethylene glycol based automotive anti-freezes. It also occurs in measurable quantities in surface waters receiving runoff from sewage treatment plants, waste disposal facilities, septic systems, reststops, parking lots and probably from other automobile-related facilities.

Toxicological data for laboratory cultured aquatic organisms, while limited, indicate that acute toxicities are rather low. Reported 48 hr LC50's for fish range from 8450 to 81300 parts per million, hereinafter ppm, (Yoshioka et al 1986; Juhnke and Ludemann 1978; Dawson et al. 1975; Meier 1986). Toxicity for invertebrates appears to be somewhat higher. Meier (1986) reported a 24 hr EC50 for Ceriodaphnia of 299 ppm and a 48 hr EC50 of 163 ppm in static bioassays. Bringmann and Kuhn (1977) reported higher values for Daphnia magna of 4700 ppm (24 hr LD50).

The effect of contaminants in real ecosystems are potentially much more complex than can be measured in simple acute bioassays performed in the laboratory. Longterm exposure, considerations of fate and transport, potential bioaccumulation, differential life-stage response and potentials for synergism all contribute to enhancing the sensitivity of natural ecosystems to chemical contamination. From considerations of volume and concentration in the dioxane contaminated aquifers, it appears that Honey Creek has been receiving dioxane containing groundwater for a period of not less than 10 years. The effect of this long-term exposure is of interest, both in terms of specifying potential environmental damage, and because it provides a unique opportunity to examine the effects of long-term low-level exposures on an entire stream ecosystem to a potentially widespread industrial contaminant.

In this report the results of preliminary and follow-up studies of the impacts of dioxane on the fauna and flora of Honey Creek are presented. The report's purpose is to specifically assess whether the chronic exposure of Honey Creek to 1,4-dioxane has led to observable abnormalities in the ecological structure of this stream.

II. INTRODUCTION

A. General Description of Location

The Honey Creek watershed is primarily located west-northwest of the City of Ann Arbor in Scio Township, Washtenaw County (T 2S, R 5E). Figure 1 identifies the regional location of the GSI facility. Plate I identifies the location of Honey Creek and its tributaries. Surface water generally flows northeasterly, discharging into the Huron River in the SE 1/4 of the SW 1/4 of Section 12 of Scio Township.

B. General Description of Environment

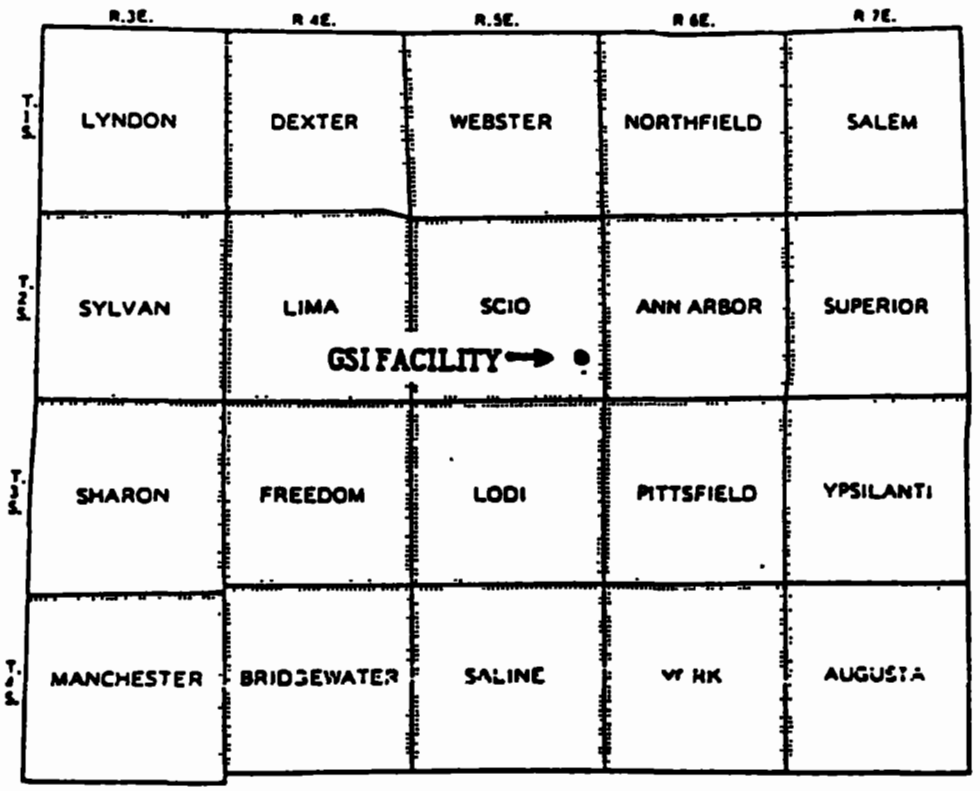
Ann Arbor, in the east central Washtenaw County and in the Southwest Lower Climatic Division, is 30 miles south west of Detroit and 40 miles north of the Ohio border. The Huron River flows southeastward through the city on its journey to Lake Erie. The surrounding terrain is partially wooded and varies from gently undulating to moderately rolling hills.

Due to the inland location in southeast Michigan, the Great Lakes' influence on Ann Arbor's climate is minimized. The most noticable influence is increased cloudiness which moderates minimum temperatures during cold air outbreaks in the late fall and early winter months. The continental character of Ann Arbor's climate is reflected by the larger daily, seasonal, and annual temperature changes experienced at Ann Arbor when compared with stations nearer the Great Lakes and at a similar latitude.

Figure 1
Regional Location Map

N

WASHTENAW COUNTY



Temperature data available from NOAA and the Michigan Weather Service, summarizing the period from 1940 to 1969, show the following extremes: a high of 105 F; and a low of 21 F below zero. The warmest monthly mean temperature typically occured in July with an average temperature of 72.7 F, and daily maximum of 83.4 and a daily minimum of 62.0 F. The coldest month is January with an average temperature of 24.8 F. Daily, high and low are 31.8 F and 17.8 respectively. Precipitation is well distributed throughout the year with the crop season, May to October, receiving an average of 16.72 inches or 56% of the average annual total of 30.10 inches. May, with 3.25 inches, was the wettest month, while February with a 1.65 inch average, was the driest.

To contrast this with more current information, a Local Climatological Data, Annual Summary with Comparative Data for 1986 was obtained for the Detroit, Metropolitan Airport. This station is the current NOAA station for the area and is located approximately 40 miles east of Ann Arbor. Data received summarize the period from 1957 to 1986. The warmest month was July with an average temperature of 71.9 F. Record extremes ranged from 83.1 F high to 60.7 F low. The coldest month was January with 29.5 F and 14.7 F, record maximum and minimum temperatures respectively. The average temperature during this month for the study period was 22.1 F. Average precipitation was 32.27 inches with June being the wettest month with an average of 3.58 inches of precipitation. February was the driest month receiving only an average of 1.72 inches of precipitation.

III. METHODS

A. Field Surveys

Data on the macroinvertebrate taxonomic composition, stream habitat (sedimentary) characteristics, flow, general water chemistry and dioxane concentrations were obtained from each of 34 sampling stations on Honey Creek (21 sites) and adjacent, uncontaminated Mill Creek (13 sites), as indicated on Plates I and II respectively.

Discharge at each site was monitored biweekly from August 30, 1988 to January 30, 1989. The purpose of this data collection was to assess flow variability in general, and more specifically to determine which of the sites in the sampling array were intermittent, and which were perennial with respect to flow. Discharge was measured using standard cross-section techniques (Buchanan and Sommers 1973), with the average flow velocity being determined with Marsh-McBirney magnetic resonance velocity meters.

Dioxane concentrations were measured once a month at each Honey Creek station. After an initial survey in August 1988 found no traces of dioxane in the Mill Creek system, dioxane was assumed to be continuously absent from all Mill Creek stations.

Standardized effort (1 man-hour) qualitative sampling was employed to assay macroinvertebrate species composition at each of 33 primary sampling stations during Sept-Oct 1988. Samples were collected using 0.5 mm kick-screens, dip nets and by the picking of individual invertebrates from rock and plant samples. Specimens were preserved in 80% ethanol and returned to the laboratory for identification. All arthropods (primarily crustaceans and insects), with the

exception of the family Chironomidae, were identified at least to genus using a variety of current taxonomic references (Pennak 1978, Merritt and Cummins 1984, Usinger 1956, Hilsenhoff 1981, Edmunds, et al. 1976, Hitchock 1974, Wiggins 1977, Mackie et al. 1980, Page 1985). When practical tentative species identifications were also made.

In addition to the 1989 sampling, earlier auxiliary collections were made at 14 of the Honey Creek sites during 1988 using similar techniques as described above. During November and December 1987, limited surveys were also made of fish and algal communities of Honey Creek. Eight stations (H-1, H-2, H-3, HT1-1, HT1-3, HT2-1, H-10 and H-11) along the main branches of the creek were sampled.

Periphyton colonizing unglazed ceramic tile substrates after a period of two weeks (2 replicates per station) were analyzed for taxonomic composition, organic carbon (ash-free dry weight) and chlorophyll content. This allowed a characterization of the sampled sites in terms of relative algal productivity (rate of periphyton accrual); algal species richness and diversity, algal condition (chlorophyll a to pheophytin ratio), and autotrophic index (ratio of bacterial and fungal to algal biomass). Algal samples were identified under 1500x magnification (1.3 N.A., Lietz LM Lux compound microscope). Chlorophyll and pheophytin were determined spectrophotometrically after samples were frozen, ground and extracted overnight in acetone.

Proportional representation of various substrate classes at each site was estimated using line transect surveys (Merna et al. 1981). Eight to ten transects were run at each station with bottom type

classified at 0.5 ft (or less in narrow channels) intervals following categories outlined in Table 1. Since sedimentation appeared to be a major problem in much of the Honey Creek drainage, these data were condensed for purposes of the analyses below into percentage of total area comprised of sand or finer (silt, clay) sediments (termed sediment composition through the rest of this report).

Table 1- Bottom type classifications used in habitat quality surveys

category	size range (diameter or longest axes in mm)
clay	<.004
silt	0.062-0.004
sand	2.000-0.062
gravel	64.000-2.000
cobble	>64.000
log	N/A
macrophytes	N/A

Fish were sampled by means of electroshocking. Methods and effort varied between the mainstream and upper tributary sites. At the mainstream stations, an electric seine was used to sample 50 to 150 feet of the stream. Blocking seines were placed at the top and bottom of each sample site to prevent fish from escaping. This method required an electrical generator to produce sufficient current to stun fish in the water; fish were then netted, identified and counted. Tributary stations were sampled by backpack electroshocker. This system used a battery to produce DC pulsed electricity, and was more portable than the electric seine. Fish identifications were made from Hubbs and Lagler (1964). Fish were

identified and counted in the field, and reference collections were taken, preserved in formalin, and examined in the laboratory to verify field identifications.

B. Statistical Analyses

The impact of dioxane on Honey Creek was assessed using standard multiple regression techniques, employing logarithmic (base e) transformations of four variables:

(1) total macroinvertebrate taxonomic richness;
(2) number of Ephemeropteran species;
(3) number of Trichopteran species at each site; and
(4) number of fish species.

These variables were treated as dependent variables in regression analyses where known covariates of species richness were used as independent predictor variables. The covariates included:

(1) the natural logarithm of the drainage basin area, which is a flow frequency independent index of stream size and is frequently correlated with species richness (Karr et al. 1986);
(2) habitat sedimentation (% channel comprised of sand, silt or clay), typically inversely related to taxonomic richness for most groups of insects (Hynes 1970, Minshall 1980); and
(3) a dummy variable for intermittent versus perennial flow, intermittent streams having generally lower diversity than their perennial counterparts (Smith et al. 1971).

Dioxane effects were entered into the regression equations in each of two separate ways. The first was as a continuous variable equal to average

concentration during the monitoring period Aug 1988 through Jan 1989, or the second as a dummy variable coded (0 or 1) to represent the presence or absence of dioxane. In this case all stations having an average dioxane concentration during the monitored period of 1 ppb or more were coded as dioxane contaminated (i.e. given a value of 1). Seven of the eleven stations at which dioxane was detected fell into this category as indicated in Table 2. These seven represent the stations with the highest average concentrations during the study period, and ranged from 1 to 30 ppb.

The initial regression model tested for each independent variable was therefore :

$$y = a + b1\,(\ln \text{drainage area}) + b2\,(\%\text{fines}) + b3\,(\text{intermittency}) + b4(\text{dioxane in ppm}) + \text{error}$$

The hypothesis that the regression coefficient for dioxane (b4) is significantly different from zero (at a=0.05) was then evaluated based upon the T-statistic for that coefficient. This provides a explicit test for a dioxane effect in the presence of other key independent variables (stream size, sedimentation and intermittency) known to be important in controlling faunal diversity in streams. In hypothesis tests of total taxonomic diversity, data used were restricted to the Fall 1988 sampling. For the hypothesis tests concerning Trichopteran and Ephemeropteran diversity, data from both preliminary and fall 1988 collections were combined. Although this introduces some variation in sampling effort between stations, using all available data gives the most comprehensive picture of the mayfly and caddisfly fauna at each site, and increases the likelihood of detecting impacts on relatively rare taxa.

IV. RESULTS and DISCUSSION

A. Honey Creek Tributary System

1. Surface Drainage Characteristics

Honey Creek is a small tributary system of the Huron River which drains an approximately 20 square mile area just to the west of the city of Ann Arbor. Two principal forks of Honey Creek (referred to throughout as the east branch and west branch) originate on the north faces of Cary-Age terminal moraines comprised chiefly of sandy gravels, or in the three kettle-hole lakes sitting in till plains at the base of these moraines. The upper west branch passes through an extensive (about 1 sq mile) wetland area with organic muck soils in the vicinity of Liberty Road. Similar, but less extensive wetland areas are found in the upper drainage of the east branch, adjacent to First-, Second-, and Third-Sister Lakes. The east branch passes through the GSI property, and drains approximately 8.1 square miles. Numerous spring seeps feed Honey Creek in these areas, the most extensive of which are located to the south of Liberty Rd. on the west branch, and near Park Rd on the east branch.

East and west branches converge just north of I-94 (section 22, Scio Twp). Downstream of this convergence to Miller Rd, Honey Creek runs through an old alluvial channel overlaid with peat and muck soils. The reach is extensive riparian wetland and has minimal channel slope. Upstream reaches passing through clayey till plain soils (Sections 29, 28, 27, 26 of Scio Twp) contribute large amounts of sediment to this low slope reach. Channel aggradation and large amounts of sediment

deposition characterize the reach between Jackson and Pratt Rds. As Honey Creek passes under Miller Rd. channel slope increases and the stream traverses primarily outwash gravels for the final 1.5 mile run to the Huron River.

There are no permanent gauging stations on Honey Creek, therefore flow characteristics are difficult to describe with precision. Clearly much of the upper east branch is ephemeral, with permanent flow probably restricted to reaches below the springs near Park Rd. Data from several USGS gauges on the Huron River, and the nearby River Raisin, were evaluated to determine seasonal flow patterns. This data indicate that annual low flows in the late summer are typically 1/8 to 1/4 the flows found late in the year.

Because of this lack of available data on flow characteristics for Honey Creek, discharge at each sampling station was monitored biweekly from August 30, 1988 to January 30, 1989. Resultant data was used in assessing flow variability, in general, and more specifically in determining which of the sampling sites in the array were intermittent. Table 2 provides summary data for 31 stations.

2. Surface Water Quality

Water quality in Honey Creek tributary system was examined at eight sampling stations on December 11 1987, as part of a preliminary stream study. Analytical results of these samples are included in the Appendices. The locations of these sampling stations are depicted on Plate I.

Table 2 Summary data for 31 study stations. River: H=Honey Creek, M=Mill Creek; % fines= percent sand or finer sediment; intermittent: y=yes,n=no;

River	Site	Drainage (sq.miles)	% fines	inter-mittent	total taxa	mayfly taxa	caddisfly taxa	dioxane avg. ppm
H	0-1	17.81	44	n	15	3	5	0.0007
H	0-2	15.77	72	n	14	3	5	0.001
H	0-3	12.78	73	n	15	4	4	0.0007
H	0-4	12.01	86	n	14	0	4	0.0007
H	0-5	6.50	82	n	9	0	1	0
H	0-6	6.30	96	n	12	0	2	0
H	0-7	4.62	94	n	12	0	1	0
H	0-8	4.19	96	n	8	0	3	0
H	0-9	4.00	61	n	9	3	0	0
H	0-10	3.66	56	n	19	3	7	0
H	0-11	2.58	100	n	12	0	3	0
H	1-1	3.03	87	n	13	0	4	0.009
H	1-2	2.94	30	n	16	0	6	0.013
H	1-3	0.58	68	n	8	2	3	0.02
H	1-4	0.45	57	y	7	0	0	0.004
H	1-5	0.32	79	y	7	0	1	0.013
H	2-1	2.26	59	n	5	1	0	0
H	2-2	0.30	100	y	4	0	0	0.03
H	3-1	4.11	80	n	11	1	3	0.0005
M	0-1	38.13	37	n	11	2	4	0
M	0-2	26.31	32	n	18	2	2	0
M	0-3	9.17	55	n	15	3	4	0
M	1-1	6.46	50	n	12	3	2	0
M	1-2	5.28	80	n	18	1	1	0
M	2-1	10.60	73	n	13	2	3	0
M	2-2	0.19	90	y	1	0	0	0
M	3-1	4.11	21	n	15	2	4	0
M	3-2	0.31	95	y	4	0	1	0
M	3-3	0.50	90	y	6	0	0	0
M	4-1	11.24	100	n	10	1	0	0
M	4-2	1.94	80	n	12	1	6	0

Stream quality was typical of streams in this area for most parameters measured (Winnell, 1975; MDNR 1979). Total dissolved solids ranged from 440 to 540 ppm. Phosphorus levels were minimal at a reading of 0.01 mg/l for Total Phosphorus. Nitrate-N results were slightly elevated, they exceeded 2 ppm in the west branch; the source is unknown. Nitrate levels in the upper east branch were substantially lower (<1.0 ppm), and the main stream ranged from 0.9 to 1.2 ppm. With the exception of 1,4-dioxane detected at stations HT1-3, HT-1, H-1, H-2 and H-3 and tetrahydrofuran at HT1-3, no traces of volatile organics, pesticide residues or other exotic contaminants were found at the sites examined. Dioxane concentrations were measured monthly at all Honey Creek sampling stations between August, 1988 and January, 1989. Average dioxane results for each station are summarized in Table 2. Results from individual sampling events are contained in the Appendices.

General water quality for Mill Creek was examined on August 17, 1988. Analytical results of these samples have also been included in the Appendices. Mill Creek sampling stations, depicted on Plate II, were selected for use in statistical comparison in the multiple regression model.

Total dissolved solids ranged from 380 to 660 ppm. Phosphorus levels varied from less than 0.01 to 0.20 mg/l. Nitrate-N results, as with Honey Creek, appeared slightly elevated; they ranged from <0.02 to 2.4 No traces of volatile organics, pesticide residues or other exotic contaminants were found at any of the Mill Creek sites examined.

Although no trace of contaminants (with the exceptions noted above) were found in samples from the aforementioned Honey Creek study sites, careful inspection of auxiliary stations (H-6 to H-9) on the lower west branch suggests lowered environmental quality in this reach due to both sediment pollution and discharges of petroleum products from unknown sources. Heavy rill and sheet erosion is evident in the reach of the west branch between Staebler and Jackson Roads. Sediment deposition is widespread throughout the channel from Jackson Rd downstream to near the confluence with the east branch (H-5). Furthermore, oily deposits were found on substrates in the west branch downstream of I-94. Spill containment barriers (surface booms) were present at the I-94 culvert and at the University Microfilm fence line. These also had a petroleum-like odor, suggesting recent petrochemical pollution. Reduced water quality in this reach appears to be associated with poorer invertebrate communities in this reach and at HC-4.

B. Macroinvertebrates

A total of 82 taxa were collected from the Honey Creek and Mill Creek drainage systems. These taxa are listed in Table 3. The insect faunas of both were typical of streams in this area (Wiley, unpublished data). Total taxonomic diversity increased with stream size and decreased with increasing fine sediment composition of the channel (Figure 2). Intermittent sites universally had very low diversity. It should be noted that since only streams with very small drainage areas were intermittent, intermittency and stream size were obviously correlated.

TAXA		HO-1	HO-2	HO-3	HO-4	HO-5	HO-6	HO-7	HO-8	HO-9	M3-1	M0-1	M0-2	M0-3	M1-1	M1-2	M1-3	M2-1	M2-2	M3-1	M3-2	M3-3	M4-1	M4-2
Platyhelminthes	Turbellaria																				X			
Annelida	Hirudinea							X							X		X							
	Oligochaeta not sampled																							
Pelecypoda	Pisidium	X		X							X				X	X						X	X	
	Sphaerium	X	X					X					X		X	X		X		X				
Gastropoda	Ferrissia	X	X				X	X		X	X		X	X						X				
	Helisoma															X								
	Physa	X	X	X		X	X	X	X	X				X	X	X	X			X		X		X
	Pleurocera		X																					
Isopoda	Asellus	X	X	X	X								X								X	X		
Amphipoda	Gammarus	X																						
	Hyalella					X									X						X	X		
Decapoda	Orconectes virilis	X	X	X	X							X				X								
	Cambarus robustus	X			X																			
Plecoptera	Allocapnia	X	X	X						X										X				
	Taeniopteryx	X	X	X																				
Ephemeroptera	Baetis			X										X	X									
	Caenis			X											X	X	X							
	Cloeon																							
	Isonychia		X																					
	Leptophlebia			X						X	X									X			X	X
	Paraleptophlebia															X								
	Stenacron	X	X	X						X		X	X	X	X			X		X				
	Stenonema	X	X							X		X	X	X				X		X				
Odonata	Boyeria	X			X									X										
	Calopteryx		X	X	X	X	X						X			X	X	X		X				
	Ischnura	X				X	X		X															
	Platthemis							X																
	Coenagrion									X														
	Anax																							
	Enallagma																						X	
	Stylurus											X												
	Gomphus												X	X									X	
	Cordulegaster																						X	
Hemiptera	Sigara		X	X		X	X			X					X	X	X	X		X			X	X
	Belostoma	X		X													X							
	Gerris				X			X																
	Ranatra		X																					
Coleoptera	Agabus						X																	
	Dubiraphia			X								X	X	X		X	X							
	Macronychus				X											X	X	X						
	Optioservus	X	X	X	X						X					X	X			X				X
	Hydraphilus																							
	Hydroporus			X		X				X														
	Hydrobius																							
	Peltodytes			X			X	X							X	X							X	
	Haliplus			X												X								
	Gyrinus		X																					
	Dineutus		X																					
	Optioservus	X					X			X													X	X
	Stenelmis	X																						
	Sphaerosoma					•							X											
Megaloptera	Sialis	X	X							X	X	X	X		X	X	X	X						X
	Corydalus												X	X										
	Nigronia	X											X											
Trichoptera	Hydroptila											X												
	Oxyethira											X		X										X
	Chimarra	X	X	X	X		X	X	X		X	X	X	X			X	X		X				X
	Hydropsyche	X	X	X	X		X		X		X	X	X	X		X	X	X		X		X		X
	Hydropsyche sp 2																			X				
	Cheumatopsyche		X						X															
	Diplectrona													X										
	Polycentropus																							
	Neureclipsis																							X
	Brachycentrus																					X		X
Diptera	Antocha	X	X	X							X													
	Tipula	X	X	X				X	X							X		X					X	X
	Dicranota			X																				
	Pilaria																X							
	Physastra																							
	Simulium	X	X	X	X		X	X	X	X	X	X	X		X	X	X	X		X				X
	Chironomidae	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X			X
	Chrysops	X	X	X		X		X					X	X		X							X	
	Stratiomyidae				X																			
	Anopheles							X																
	Hexatoma													X										

TABLE 3 COMPLETE TAXA LIST FOR HONEY CREEK AND MILL CREEK DRAINAGE SYSTEM SURVEYS

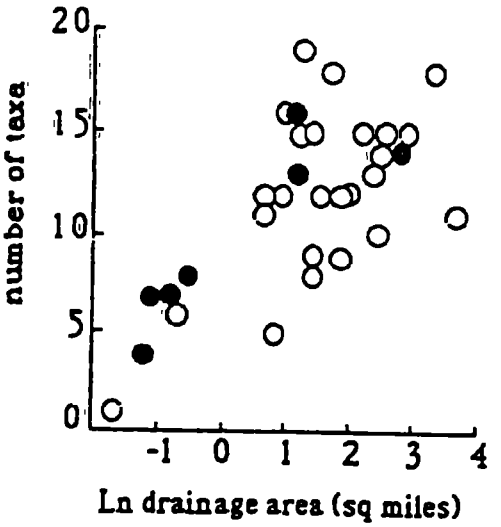
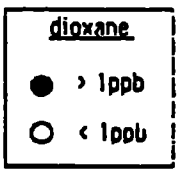


FIGURE 2A: NUMBER OF TAXA VERSUS LN. DRAINAGE AREA



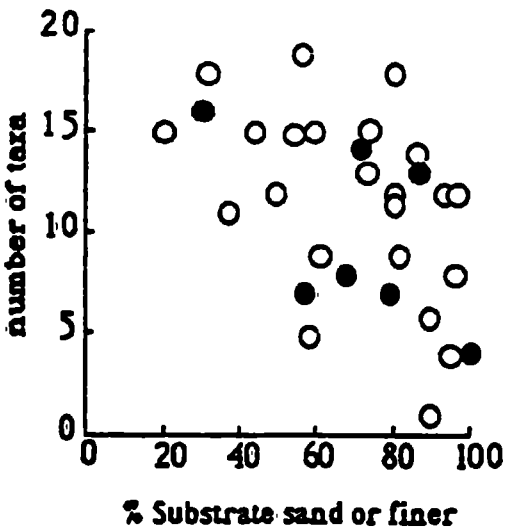


FIGURE 2B: NUMBER OF TAXA VERSUS PERCENT SUBSTRATE SAND OR FINER

Regression analyses for total taxonomic diversity, detailed in Tables 4 - 5, were significant and explained 66% of the variance observed. Stream size and intermittency contributed most of the explained variance. Sedimentation (% fines) was negatively correlated with diversity as well, although the regression coefficient was not significantly different from zero. No significant dioxane effect was found, using either average concentration or a dummy variable reflecting dioxane presence.

Regression analyses for number of Ephemeropteran genera and number of Trichopteran genera were also significant. These analyses are detailed in Tables 6, 7 and 8. For the Trichoptera, intermittency was the most significant variable, whereas for the Ephemeroptera % fines was the dominant independent variable. In both analyses intermittency and drainage area appeared to be correlated and the elimination of one substantially increased the statistical significance of the other. A significant dioxane effect was not found in either of the regressions.

Preliminary studies in Winter 1987-88 of 14 of the Honey Creek sites identified reductions in mayfly diversity (Ephemeroptera) at certain locations in the Creek. These early studies did not provide sufficient data to conclusively determine whether the reduced mayfly diversity was related to the presence of dioxane or other stream variables. The current study has involved a larger number of both control (uncontaminated) and affected (contaminated) sites. In addition, data on other potentially significant variables, including habitat quality and intermittency, have been evaluated. In this current study, no indication of a significant dioxane effect on mayfly diversity was found.

Multiple Regression Y1:total 89 4 X variables

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
30	782	612	.552	3.028

Analysis of Variance Table

Source	DF.	Sum Squares.	Mean Square:	F-test:
REGRESSION	4	375.588	93.897	10.243
RESIDUAL	26	238.347	9.167	p = 1.0000E-4
TOTAL	30	613.935		

No Residual Statistics Computed

Note: 4 cases deleted with missing values.

Multiple Regression Y1:total 89 4 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	13.708				
intermittent2	-3.877	2.371	-.344	1.635	.1141
%fines	-.045	.026	-.229	1.73	.0955
dioxane ppm	26.598	91.254	.041	.291	.773
ln of area	1.2	.737	.378	1.627	.1156

TABLE 4: REGRESSION ANALYSIS FOR TOTAL MACROINVERTEBRATE TAXA, TESTING FOR DIOXANE EFFECTS

Multiple Regression Y1:total 89 3 X variables

DF:	R:	R-squared:	Adj R-squared:	Std Error:
30	.756	572	.524	3.12

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	3	351 078	117.026	12.021
RESIDUAL	27	262 858	9.735	p = 1 0000E-4
TOTAL	30	613.935		

No Residual Statistics Computed

Note: 4 cases deleted with missing values.

Multiple Regression Y1:total 89 3 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability
INTERCEPT	11.828				
dioxane ppm	39.974	93.661	.062	.427	.6729
ln of area	2.118	.492	.667	4.303	2.0000E-4
%fines	-.046	.027	-.23	1.691	.1024

TABLE 5: REGRESSION ANALYSIS FOR TOTAL MACROINVERTEBRATE TAXA, TESTING FOR DIOXANE EFFECTS INTERMITTENCY VARIABLE ELIMINATED.

Multiple Regression Y1:trichop 3 X variables

DF	R:	R-squared	Adj. R-squared	Std. Error:
31	.593	.352	.282	1.721

Analysis of Variance Table

Source	DF	Sum Squares	Mean Square	F-test
REGRESSION	3	45.027	15.009	5.067
RESIDUAL	28	82.942	2.962	p = .0063
TOTAL	31	127.969		

No Residual Statistics Computed

Note: 3 cases deleted with missing values.

Multiple Regression Y1:trichop 3 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err..	Std. Value:	t-Value:	Probability.
INTERCEPT	4.546				
dioxane ppm	36.29	47.934	.123	.757	.4553
%fines	-.023	.014	-.255	1.595	.1219
intermittent2	-2.533	.869	-.494	2.915	.0069

TABLE 6: REGRESSION ANALYSIS FOR CADDISFLY (TRICHOPTERAN) TAXA, TESTING FOR DIOXANE EFFECTS. INTERMITTENCY VARIABLE ELIMINATED.

Multiple Regression Y_1:eph 4 X variables

DF:	R:	R-squared:	Adj. R-squared:	Std. Error:
30	.658	.433	.346	1.059

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	4	22.269	5.567	4 966
RESIDUAL	26	29.15	1.121	p = 0041
TOTAL	30	51 419		

No Residual Statistics Computed

Note: 4 cases deleted with missing values.

Multiple Regression Y_1:eph 4 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability:
INTERCEPT	2.561				
dioxane ppm	-4.377	31.913	-.023	.137	.892
%fines	-.024	9.194E-3	-.413	2.589	.0156
intermittent2	-.3	.829	-.092	.361	.7207
ln of area	.27	.258	.294	1.047	.3046

TABLE 7: REGRESSION ANALYSIS FOR MAYFLY (EPHEMEROPTERAN) TAXA, TESTING FOR DIOXANE EFFECTS.

Multiple Regression Y_2:eph 3 X variables

DF	R:	R-squared:	Adj R-squared:	Std Error:
30	.656	.43	.367	1.042

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	3	22.123	7.374	6.796
RESIDUAL	27	29.297	1.085	p = 0015
TOTAL	30	51.419		

No Residual Statistics Computed

Note: 4 cases deleted with missing values.

Multiple Regression Y_2:eph 3 X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value:	Probability.
INTERCEPT	2.516				
dioxane ppm	-3.343	31.269	-.018	.107	.9157
ln of area	.341	.164	.371	2.075	.0476
%fines	-.024	9.044E-3	-.414	2.634	.0138

TABLE 8: REGRESSION ANALYSIS FOR MAYFLY (EPHEMEROPTERAN) TAXA. TESTING FOR DIOXANE EFFECTS. INTERMITTENCY VARIABLE ELIMINATED.

There continues to be a region in Honey Creek downstream of HT1-3, HT3-1 and H-8, and upstream of H-3 which is oddly bereft of mayflys. Since this region includes reaches which are both contaminated and clean with respect to dioxane, and since mayflys are present in the most seriously dioxane contaminated perennial reaches upstream, there seems to be no connection between this absence of mayflys and dioxane (as the regression analyses indicate).

This area is located in the Jackson Rd/ I-94 corridor, and is clearly subjected to serious bedload problems. It seems likely that some combination of periodic contamination (e.g. road salting) and general habitat degradation associated with the heavy commercial development of the area are important contributing factors to this problem.

C. Algal communities

Periphyton recovered from artificial substrates was dominated by diatoms (Bacillariophyceae) at all stations as indicated in Tables 9 and 10. Dominant forms included Achnanthes, Gomphonema, Navicula, Nitzschia, and at HT2-1 Meridion. These are typically abundant genera in streams in this area (MDNR 1979). Algal species-richness was good at all sites, ranging from 21 to 35 identifiable species per sample. Species richness increased in a downstream direction, with H-2 and H-1 having the greatest number of taxa. Diversity indices (base e), listed in Table 9, were variable and ranged from 1.5 to 2.8. None of these values are particularly low. Chlorophyll standing crops ranged from 0.2 to almost 6 ug/cm^2. Values of 10-15 ug/cm^2 are not unusual in small streams in adjacent watersheds during the summer.

Table 9 Periphyton community summary for Honey Creek stations (as %).

November and December, 1987.

Taxa	H-1	H-2	H-3	H-10	H-11	HT1-1	HT1-3	HT2-1
Green Algae	7.5	7.1	12.1	13.1	32.0	17.8	21.1	13.2
Diatoms	90.3	92.9	84.4	86.9	57.4	77.0	74.3	80.0
other algae	2.2	0.0	3.5	0.0	9.8	3.2	5.6	6.8
Achnanthes	3.1	0.5	1.9	3.8	49.7	0.0	8.9	2.5
Amphora	0.5	0.1	0.4	1.7	13.3	0.0	0.3	0.4
Caloneis	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Cocconeis	0.5	0.0	0.8	0.0	0.7	0.0	0.0	0.2
Cyclotella	0.5	0.0	0.0	0.3	0.0	1.6	0.3	0.0
Cymatopleura	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Cymbella	0.0	0.1	0.4	0.0	0.0	0.8	0.0	0.0
Eunotia	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Fragilaria	0.0	0.5	0.0	14.2	0.0	0.0	5.9	1.1
Gomphonema	3.1	1.4	3.9	6.7	9.0	2.4	63.0	47.0
Gyrosigma	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Melosira	0.0	1.7	0.0	0.0	0.0	4.0	0.0	0.0
Meridion	0.0	0.0	0.4	9.9	3.5	0.8	6.4	42.3
Navicula	71.4	86.1	79.5	21.5	11.2	27.0	4.8	3.9
Nitzschia	16.8	7.5	10.0	19.5	9.8	53.2	8.9	2.3
Stauroneis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Surirella	0.1	0.6	0.8	1.2	0.0	0.8	0.0	0.0
Snydera	3.1	1.2	1.5	19.2	2.8	8.7	1.3	0.2
dry weight mg/cm-2	3.81	6.04	2.04	8.98	-	31.67	0.76	1.27
AFDW m-2 mg/cm-2	0.55	0.84	0.18	0.37	-	1.97	0.15	0.32
Chlorophyll ug/cm-2	2.61	5.90	1.77	1.26	-	4.22	0.20	2.64
# taxa	31.0	35.0	28.0	29.0	24.0	24.0	28.0	26.0
Diversity	2.1	1.5	1.8	2.8	2.3	2.5	2.3	1.8
autotrophic index ug/g	4.8	7.0	9.9	3.4	-	2.1	1.3	8.2

Table 10 Micro-algae species list for Honey Creek - November and December, 1987.

Taxa	H-1	H-2	H-3	H-10	H-11	HT1-1	HT1-3	HT2-1
Achnanthes sp			X			X		
Achnanthes lanceolata		X	X			X	X	
Achnanthes lanceolata v. dubia	X	X	X	X	X		X	
Achnanthes minutissima	X	X		X	X	X	X	
Amphora spp.	X	X	X	X	X	X	X	
Ankistrodesmus spp.	X	X				X		
Bluegreen filaments							X	
Caloneis amphisbaena	X							
Chrysophean flagellates	X	X		X		X	X	X
coccoid greens		X	X	X	X	X	X	X
Cocconeis placentula v. lineata		X		X				
Cocconeis pediculus	X					X		
Cyclotella meneghiniana			X	X				X
Cyclotella ocellata							X	
Cyclotella stelligera								X
Cymatopleura sp.					X			
Cymbella spp.	X				X			X
desmids					X			
Eunotia sp.							X	
Fragilaria intermedia v. fallax			X					
Fragilaria pinnata					X		X	
Fragilaria vaucheriae			X		X	X	X	
Gloeocystis sp.		X			X			
Gomphonema spp.	X	X	X	X	X	X	X	X
Gomphonema acuminatum								X
Gomphonema angustatum						X	X	X
green cells	X	X		X	X	X	X	X
Gyrosigma sp.					X			
Melosira spp.					X			
Meridion circulare	X	X				X	X	X
Meridion curculare v. constrictum			X			X		
Mougeotia sp.						X		
Navicula capitata	X		X	X	X			
Navicula cryptocephala	X	X	X	X	X	X	X	X
Navicula gracilioides				X				
Navicula menisculus v.upsallensis	X		X	X	X	X		X
Navicula pupula					X			
Navicula rhynchocephala					X			
Navicula rhynchocephala v. amphicaros	X	X	X	X	X	X		
Navicula spp.		X	X	X	X			X
Navicula tripunctata v. schizonemoides				X				
Navicula viridula	X	X		X	X	X		X
Navicula viridula v. avenacea				X				
Nitzschia aciculari	X		X		X		X	X
Nitzschia acuta			X	X	X			
Nitzschia bacata				X				
Nitzschia capitellata				X	X			
Nitzschia confinis			X		X			
Nitzschia dissipata	X	X	X	X	X	X		
Nitzschia palea	X		X	X	X	X		X
Nitzschia paleacea	X			X		X	X	
Nitzschia recta	X	X	X	X	X		X	X
Nitzschia spp.	X	X	X	X	X	X		X
Oedogonium sp.			X					
Scenedesmus spp.		X		X	X	X	X	X
Stauroneis smithii								X
Surirella angustata	X		X		X			X
Surirella nr. ovalis				X	X			
Synedra amphicephala						X		
Synedra filiformis		X	X					
Synedra minuscula			X					
Synedra parasitica				X	X			X
Synedra tenera			X				X	
Synedra ulna	X	X	X	X	X			X
Ulothrix sp	X						X	

The Honey Creek values are somewhat lower, but this is to be expected in the late fall when low water temperatures reduce rates of primary production.

Autotrophic Index (AI) values give a rough measure of the relative contribution of microbial and algal communities to total periphyton biomass. High values reflect a high ratio of algae to bacteria and fungi, whereas low values suggest heterotrophic organisms dominate the sample (APHS 1981). AI values, listed in Table 9, ranged from 1.3 to 9.8. Of some interest is the observation that the lowest AI values were observed at HT1-3 and HT1-1. These two stations had the highest dioxane concentrations of the sites at which algal communities were examined. The next lowest site was H-11, a site with very low flow and heavy canopy cover and which showed reduced diversity in every biological component examined. The significance of observed low AI values is debatable, and no statistically significant correlation with dioxane could be found.

D. Fish

The fish fauna of Honey Creek was again typical of that found in small streams of the region. As indicated in Table 11, the most abundant fishes collected were the bluntnose minnow, common shiner, and brook silverside. Tables 12 through 19 list the species found at each station during the November and December 1987 surveys. These species also predominate in collections throughout the region (Smith et al. 1981). The fauna was dominated by nongame fishes, and only a few centrarchids (rock bass, largemouth bass, smallmouth bass, and sunfish were taken. This is also typical of small streams in the area, which generally have a limited population of top carnivores (Anderson 1983).

Table 11 A summary of all fishes collected from Honey Creek during sampling in 1987.

Species	Common Name	Number
Pimephales notatus	Bluntnose minnow	1228
Notropis cornutus[1]	Common shiner	468
Labidesthes sicculus	Brook silverside	269
Cottus bairdi	Sculpin	120
Catostomus commersoni	White sucker	96
Semotilus atromaculatus	Creek chub	71
Micropterus salmoides	Largemouth bass	22
Compostoma anomalum	Stoneroller	15
Rhinichthys atratulus	Blacknose dace	14
Lepomis gibbosus	Pumpkinseed	7
Lepomis macrochirus	Bluegill	6
Percina caprodes	Log perch	6
Ambloplites rupestris	Rock bass	5
Ichthyomyzon fossor	Brook lamprey	4
Hypentelium nigricans	Hogsucker	3
Micropterus dolomieui	Smallmouth bass	3
Moxostoma sp	Redhorse	3
Lepomis cyanellus	Green sunfish	3
Umbra limi	Mudminnow	3

[1] Individuals which were collected may have been Striped shiners (Notropis chrysoleucas) or hybrids, as they are very similar and as laboratory identifications were often borderline between the two species.

Table 12 Summary of fishes collected on 29 November 1987 from the mainstream of Honey Creek at Huron River Drive (H-1). The area was mainly a pool. Total area for electric seining was approximately 273 linear feet.

Species	Common Name	Number
Labidesthes sicculus	Brook silverside	114
Notropis cornutus	Common shiner	287
Micropterus salmoides	Largemouth bass	8
Cottus bairdi	Sculpin	6
Catostomus commersoni	White sucker	23
Lepomis gibbosus	Pumpkinseed	7
Semotilus atromaculatus	Creek chub	5
Pimephales notatus	Bluntnose minnow	918
Hypentelium nigracans	Hogsucker	1
Micropterus dolomieui	Smallmouth bass	2
Ambloplites rupestris	Rock bass	3
Ichthyomyzon fossor	Brook lamprey	3
Lepomis cyanellus	Green sunfish	1

Table 13 Summary of fishes collected on 22 November 1987 from the mainstream of Honey Creek at Miller Road (H-2). The area was a riffle-pool complex. Total area for electric seining was approximately 270 linear feet.

Species	Common Name	Number
Labidesthes sicculus	Brook silverside	149
Notropis cornutus	Common shiner	136
Micropterus salmoides	Largemouth bass	11
Cottus bairdi	Sculpin	62
Catostomus commersoni	White sucker	44
Lepomis commersoni	Bluegill	5
Lepomis gibbosus	Pumpkinseed	1
Semotilus atromaculatus	Creek chub	20
Pimephales notatus	Bluntnose minnow	310
Hypentelium nigracans	Hogsucker	2
Percina caprodes	Log perch	6
Micropterus dolomieui	Smallmouth bass	1
Ambloplites rupestris	Rock bass	2
Ichthyomyzon fossor	Brook lamprey	1
Moxostoma sp.	Redhorse	3
Campostoma anomalum	Stoneroller	2

Table 14 Summary of fishes collected on 29 November 1987 from the mainstream of Honey Creek at Pratt Road (H-3). The area was very sandy with one main pool. Total area for electric seining was approximately 190 linear feet.

Species	Common Name	Number
Labidesthes sicculus	Brook silverside	6
Cottus bairdi	Sculpin	12
Lepomis commersoni	Bluegill	1
Semotilus atromaculatus	Creek chub	9
Campostoma anomalum	Stoneroller	3
Umbra limi	Mudminnow	1
Notropis cornutus	Common shiner	43
Castostomus commersoni	White sucker	13

Table 15 Summary of fishes collected on 6 December 1987 from a tributary of Honey Creek at Staebler Road (H-10). The area was mainly a rock riffle. Total time for backpack shocking was 1348 seconds.

Species	Common Name	Number
Rhinichthys atratulus	Blacknose dace	12
Castostomus commersoni	White sucker	1
Campostoma anomalum	Stoneroller	1
Notropis cornutus	Common shiner	1
Cottus bairdi	Sculpin	35
Semotilus atromaculatus	Creek chub	14

Table 16 Summary of fishes collected on 6 December 1987 from a tributary of Honey Creek at Liberty Road, near Zeeb Road (H-11). The area was mainly a silt bottom with very shallow water. Total time for backpack shocking was 1265 seconds.

Species	Common Name	Number
Semotilus atromaculatus	Creek chub	9
Lepomis cyanellus	Green sunfish	2
Umbra limi	Mudminnow	1

Table 17 Summary of fishes collected on 28 March 1988 from a tributary of Honey Creek at Interstate 94 (HT1-1). The area was mainly a silt to sandy bottom with shallow water. Total time for backpack shocking was 468.0 seconds.

Species	Common Name	Number
Castostomus commersoni	White sucker	1
Cottus bairdi	Sculpin	13
Notropis cornutus	Common shiner	1

Table 18 Summary of fishes collected on 3 December 1987 from a tributary of Honey Creek at Park Road (east tributary, HT1-3). The area was an open riffle-pool area. Total time for backpack shocking was 1566 seconds.

Species	Common Name	Number
Micropterus salmoides	Largemouth bass	3
Cottus bairdi	Sculpin	1
Semotilus atromaculatus	Creek chub	2
Umbra limi	Mudminnow	1

Table 19 Summary of fishes collected on 3 December from a tributary of Honey Creek at Park Road (west tributary, HT2-1). The area was mainly a large pool above a culvert. Total time for backpack shocking was 1195 seconds.

Species	Common Name	Number
Rhinichthys atratulus	Blacknose dace	2
Castostomus commersoni	White sucker	15
Campostoma anomalum	Stoneroller	9
Notropis cornutus	Common shiner	1
Cottus bairdi	Sculpin	15
Semotilus atromaculatus	Creek chub	12

The game fishes actually found in the collections were generally juveniles which may have been born in the stream or more likely migrated there. Since the numbers collected were so low, it is unlikely that substantial natural reproduction of game fishes occur in Honey Creek.

A total of 19 species of fish were collected. As indicated by Figure 3, the number of species increased with drainage area and decreased with decreasing gravel and cobble habitat respectively. For example, site HT1-1 had primarily sandy substrate, and the fish fauna was much more limited there than would be expected from the size of the stream alone. Similarly, H-11 was an area with extremely silty sediments, which made fish collecting difficult. The number of species collected there may not have been representative of actual fauna due tothe difficulty of collection, or may have reflected the lack of animals due to poor habitat quality. It is most likely that both factors influenced the collections at this site.

Smith et al (1981) determined that species of stream fishes in the Raisin River drainage (located just west of Mill Creek) could be grouped on the basis of stream size, sediment type and current velocity. All of the Honey Creek sites examined here would fall into their shallow-streamfish classification. The dominant species collected correspond closely to those they report for the Raisin River.

Although the sample size was quite limited, similar regression model tests for a dioxane effect were performed. As with the macroinvertebrates, both drainage area and % fines were significant variables in the regression and together explained 82% of the variance in the fish species richness data.

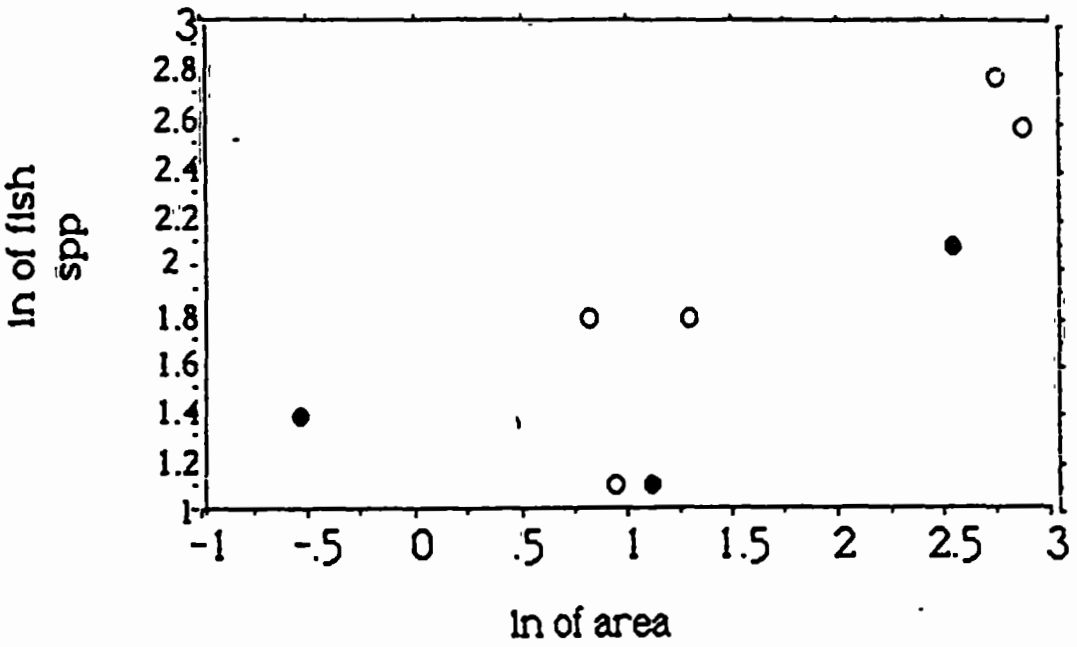
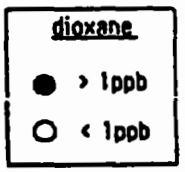


FIGURE 3A: LN. OF FISH SPECIES VERSUS LN. OF AREA



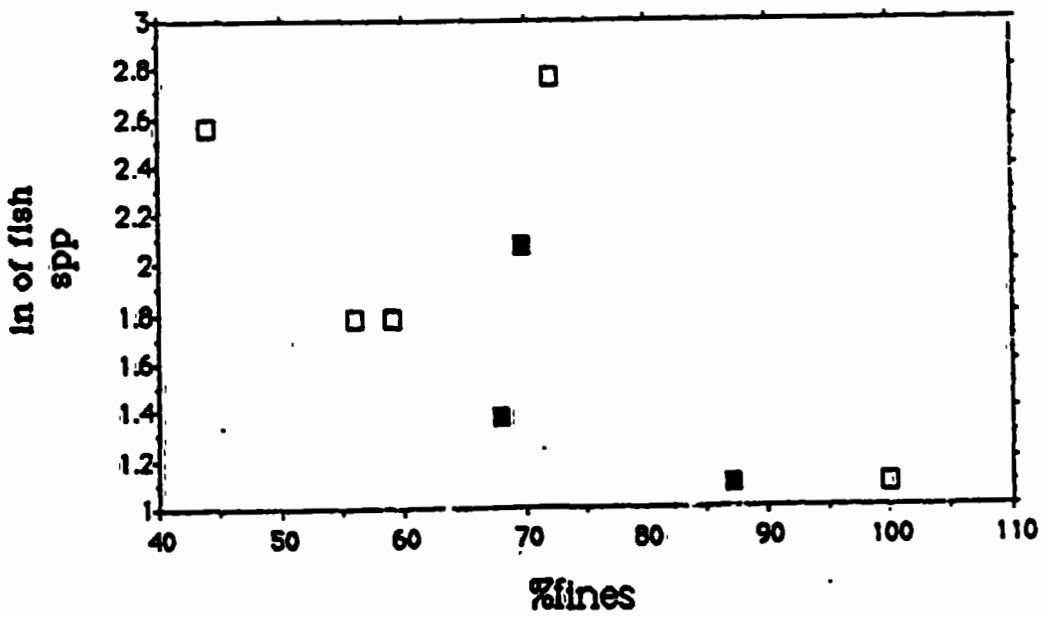


FIGURE 3B: LN. OF FISH SPECIES VERSUS PERCENT FINES

Addition of a dioxane variable reduced the overall significance of the regression, and the regression coefficients for dioxane were not significantly different from zero as detailed in Table 20 and Figure 3. It is concluded that there was no statistically significant effect of dioxane on the taxonomic diversity of fish communities at the eight sites of Honey Creek which were examined.

E. Threatened or Endangered Species

Correspondence with MDNR-Wildlife Division, included in the Appendices, indicates that there are no known occurences of any Federal or State listed threatened, endangered or protected species located in the Honey Creek watershed. It should also be noted that no threatened, endangered or protected species were encountered during any of the extensive field surveys. As such, an assessment of chronic exposure to 1,4-dioxane for these type of resources was not undertaken.

Multiple Regression Y_1: ln of fish spp. 3X variables

DF.	R:	R-squared:	Adj R-squared:	Std. Error
7	.908	.825	.693	.348

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	3	2.276	.759	6.268
RESIDUAL	4	.484	.121	p = 0542
TOTAL	7	2.76		

No Residual Statistics Computed

Note: 27 cases deleted with missing values.

Multiple Regression Y_1: ln of fish spp. 3X variables

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Std. Value:	t-Value	Probability.
INTERCEPT	2.244				
ln of area	.415	.159	.779	2.607	.0596
%fines	-.016	7.734E-3	-.439	2.012	.1145
dioxane ppm	13.609	25.403	.155	.536	.6205

Multiple Regression Y_1: ln of fish spp. 3X variables

Confidence Intervals and Partial F Table

Parameter:	95% Lower:	95% Upper:	90% Lower:	90% Upper:	Partial F:
INTERCEPT					
ln of area	-.027	.857	.076	.755	6.799
%fines	-.037	5.913E-3	-.032	9.262E-4	4.05
dioxane ppm	-56.931	84.149	-40.552	67.77	.287

TABLE 20: REGRESSION ANALYSIS FOR FISH TAXA, TESTING FOR DIOXANE EFFECTS.

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APPENDIX A

CORRESPONDENCE

STATE OF MICHIGAN

JAMES J BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T MASON BUILDING
BOX 30028
LANSING, MI 48909

GORDON E GUYER, Director

May 9, 1988

Mr. Timothy J. Rienks
Associate Biologist
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, Michigan 48108

Dear Mr. Rienks:

Your request for endangered species information was checked against known localities for special natural features recorded in the Michigan Natural Features Inventory (MNFI) database, which is part of the newly established Natural Resource Heritage Program of the Department of Natural Resources, Wildlife Division. The MNFI is an ongoing, continuously updated information base which is the most comprehensive single source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features.

There are no known occurrences of Federal- or State-listed endangered or threatened species at the location(s) specified: Honey Creek Tributary System, T2S, R5E, Scio Township, Washtenaw County.

This database, however, cannot provide a definitive statement on the presence, absence, or condition of special natural features in any given locality, since most sites have not been specifically or thoroughly surveyed for the occurrence of special features. Therefore, the information provided above should not be regarded as a complete statement on the occurrence of special natural features at the sites(s) in question.

Thank you for your advance coordination in addressing the protection of Michigan's Natural Resource Heritage.

Sincerely,

Thomas F. Weise

Thomas F. Weise
Endangered Species Coordinator
Wildlife Division
517-373-1263

TFW:sb

STATE OF MICHIGAN

COMMISSION OF AGRICULTURE

Dr. S. Leon Whitney

Rita M. Reid

George A. McManus

[redacted]

Elwood Kirkpatrick

JAMES J. BLANCHARD, Governor

DEPARTMENT OF AGRICULTURE

P.O. Box 30017, Lansing, Michigan 48909

PAUL E. KINDINGER, Director

[redacted] Inc

FEB 23 1988

Vernon L. Kretzschmer

MDA/Climatology
417 Natural Science Building
Michigan State University
East Lansing, MI 48824

February 10, 1988

Tim Rienks
Braithwaite Consultants
330 E. Liberty, Suite 3D
Ann Arbor, MI 48104

Mr. Rienks:

In response to your request for climatological data, we are enclosing the following information.

Climatological Summary for Ann Arbor, MI - Means and Extremes for Period 1940-1969.

Ann Arbor Period Analysis for 1951-1980 (30 Years) including:

- Average Maximum Temperature
- Average Minimum Temperature
- Average Temperature
- Heating Degree Days (65 F)
- Cooling Degree Days (65 F)
- Precipitation (Inches)
- Snowfall (Inches)

Photocopies of the original records for the National Weather Service cooperative observers at Ann Arbor for January thru December 1986.

"Local Climatological Data" (LCD) Monthly Summaries for Detroit for January thru December 1986 and the Annual Summary for 1986.

The above LCD is a product of the U.S. Dept. of Commerce/National Oceanic and Atmospheric Administration/National Environmental Satellite, Data and Information Service/National Climatic Data Center.

There is a charge of $15.00 for the publications and photocopies. Please make the check payable to "Michigan State University" and remit to our office on the MSU campus for proper routing.

Please feel free to contact us again should you desire further assistance with climatological information.

Fred V. Nurnberger

Fred V. Nurnberger, Ph.D.
State Climatologist
MDA/Climatology

/cms

enclosures

APPENDIX B

STREAM GAUGING STUDY RESULTS
(Flow/Discharge Monitoring)

Temp and Dissolved Oxygen Readings
and Calculated Discharge
Gelman Sciences Stream Studies

H-7	8/18/88	21.8	4.64	0.0240
	9/1/88	18.0	8.50	0.0070
	9/15/88	13.0	8.60	0.0450
	9/29/88	15.0	8.80	0.0138
	10/13/88	7.5	12.80	0.0130
	10/29/88	4.5	14.60	0.0258
	11/9/88	6.8	14.90	0.1455
	11/28/88	5.0	13.00	0.0816
	12/10/88	1.2	>15.00	0.0454
	12/22/88	2.4	15.00	0.0367
	1/6/89	1.0	>15.00	0.0415
	1/23/89	4.2	>15.00	0.0522
H-8	8/18/88	22.0	2.20	0.0080
	9/1/88	19.8	5.80	0.0010
	9/15/88	14.8	7.10	0.0000
	9/29/88	15.0	7.20	0.0000
	10/13/88	6.5	12.60	0.0082
	10/29/88	5.5	14.80	0.0225
	11/9/88	6.4	14.80	0.1260
	11/28/88	4.5	13.60	0.0881
	12/10/88	0.0	>15.00	0.0496
	12/22/88	1.2	>15.00	0.0384
	1/5/89	0.0	>15.00	0.0710
	1/23/89	2.6	13.40	0.0715
H-9	8/18/88	20.5	5.70	0.0180
	9/1/88	17.5	9.20	0.0020
	9/15/88	12.0	10.40	0.0000
	9/29/88	14.0	8.90	0.0058
	10/13/88	5.5	13.40	0.0062
	10/29/88	6.0	14.80	0.0159
	11/9/88	5.5	14.40	0.1181
	11/28/88	4.2	12.80	0.0731
	12/11/88	0.0	>15.00	0.0325
	12/21/88	2.5	>15.00	0.0304
	1/6/89	0.6	>15.00	0.0425
	1/23/89	3.4	14.90	0.0389

H-10	8/18/88	20.0	6.30	0.0170
	9/1/88	16.2	9.40	0.0050
	9/15/88	12.0	12.00	0.0020
	9/29/88	14.2	9.00	0.0085
	10/13/88	6.0	13.20	0.0069
	10/29/88	5.5	13.60	0.0177
	11/9/88	5.2	12.20	0.1078
	11/28/88	5.0	11.00	0.0774
	12/11/88	0.2	>15.00	0.0252
	12/21/88	3.0	13.60	0.0240
	1/6/89	1.0	14.60	0.0339
	1/23/89	4.0	13.90	0.0348
HT1-1	8/18/88	17.0	8.20	0.0170
	9/1/88	15.2	9.80	0.0090
	9/15/88	13.0	11.30	0.0120
	9/29/88	12.0	10.00	0.0108
	10/14/88	11.5	10.50	0.0122
	10/29/88	8.0	12.60	0.0113
	11/10/88	7.2	12.60	0.4012
	11/28/88	5.4	12.60	0.0634
	12/11/88	4.5	14.20	0.0219
	12/21/88	6.2	12.60	0.0214
	1/5/89	3.2	>15.00	0.0328
	1/23/89	6.0	14.80	0.0345
HT1-2	8/19/88	16.0	7.80	0.0150
	9/1/88	14.0	8.60	0.0070
	9/15/88	11.5	9.80	0.0050
	9/30/88	12.0	8.10	0.0082
	10/13/88	11.5	9.70	0.0100
	10/28/88	9.5	11.80	0.0106
	11/10/88	7.5	12.20	0.1679
	11/29/88	6.8	7.50	0.0271
	12/11/88	6.8	13.20	0.0159
	12/21/88	7.5	11.60	0.0167
	1/6/89	6.0	13.20	0.0175
	1/24/89	7.0	11.40	0.0178

Temp and Dissolved Oxygen Readings
and Calculated Discharge
Gelman Sciences Stream Studies

HT1-3	8/19/88	20.0	6.70	0.0110
	9/1/88	15.8	7.80	0.0010
	9/15/88	11.2	8.10	0.0040
	9/30/88	13.8	6.40	0.0022
	10/13/88	11.0	9.40	0.0031
	10/28/88	10.0	9.60	0.0074
	11/10/88	7.0	12.20	0.1755
	11/29/88	6.0	14.40	0.0298
	12/11/88	7.0	11.80	0.0100
	12/21/88	6.5	10.90	0.0104
	1/6/89	5.2	12.40	0.0043
	1/24/89	6.4	10.70	0.0108
HT1-4	8/19/88	26.5	7.20	0.0080
	9/1/88	25.0	10.80	0.0000
	9/15/88	15.8	8.60	0.0000
	9/30/88	18.2	6.65	0.0000
	10/14/88	11.0	10.30	0.0000
	10/28/88	6.0	14.00	0.0008
	11/10/88	6.5	12.20	0.1422
	11/29/88	4.0	>15.00	0.0100
	12/11/88	3.0	>15.00	0.0025
	12/21/88	1.8	>15.00	0.0033
	1/6/89	1.2	>15.00	0.0070
	1/24/89	3.4	13.20	0.0054
HT1-5	8/19/88	21.0	4.80	0.0060
	9/1/88	15.4	4.40	0.0000
	9/15/88	12.5	6.30	0.0000
	9/30/88	14.8	4.80	0.0000
	10/14/88	7.0	9.80	0.0000
	10/28/88	5.4	11.60	0.0000
	11/10/88	7.2	9.80	0.1094
	11/29/88	2.1	>15.00	0.0129
	12/11/88	0.0	9.80	0.0019
	12/21/88	0.0	13.80	0.0018
	1/6/89	0.0	12.80	0.0082
	1/24/89	0.0	12.80	0.0053

HT1-6	8/19/88	21.0	4.70	0.0030
	9/1/88	17.0	3.80	0.0000
	9/15/88	12.4	4.60	0.0000
	9/30/88	15.8	4.40	0.0000
	10/14/88	9.5	9.30	0.0000
	10/28/88	6.0	10.60	0.0000
	11/10/88	7.5	8.60	0.0966
	11/29/88	2.0	13.20	0.0057
	12/11/88	0.0	10.60	0.0032
	12/21/88	0.2	8.60	0.0038
	1/6/89	0.0	8.40	0.0151
	1/24/89	0.2	10.60	0.0041
HT1-7	8/19/88	20.8	3.00	0.0000
	9/1/88	16.0	3.10	0.0000
	9/15/88	11.5	4.20	0.0000
	9/30/88	16.2	3.20	0.0000
	10/14/88	7.0	6.60	0.0000
	10/29/88	7.0	10.40	0.0000
	11/10/88	7.0	8.00	N/A
	11/29/88	2.0	12.00	0.0060
	12/11/88	0.0	>15.00	N/A
	12/21/88	0.4	2.7	N/A
	1/6/89	0.0	10.40	N/A
	1/23/89	1.0	8.90	N/A
HT1-7/ Upstream	11/10/88	7.0	10.40	0.1856
HT2-1	8/18/88	16.0	0.80	0.0000
	9/1/88	14.0	2.80	0.0000
	9/15/88	12.0	3.80	0.0000
	9/30/88	13.5	0.40	0.0000
	10/14/88	8.5	2.40	0.0000
	10/29/88	5.8	4.80	0.0000
	11/11/88	5.2	11.90	0.2001
	11/29/88	3.0	14.80	0.0164
	12/11/88	2.2	10.00	0.0000
	12/21/88	1.2	>15.00	0.0020
	1/6/89	0.2	14.70	0.0160
	1/24/89	0.4	13.00	0.0103

HT2-2	8/19/88	22.0	5.80	0.00002
	9/1/88	N/A	N/A	0.0000
	9/15/88	N/A	N/A	0.0000
	9/29/88	18.5	6.40	0.0001
	10/14/88	6.5	8.60	0.00002
	10/28/88	8.6	9.60	0.0000
	11/9/88	8.2	9.80	0.0041
	11/29/88	3.0	11.10	0.0004
	12/11/88	0.0	>15.00	0.0000
	12/21/88	0.6	11.40	0.0003
	1/6/89	0.0	>15.00	0.0021
	1/23/89	0.2	>15.00	0.0011
HT3-1/Sarns	8/18/88	22.5	2.60	0.0370
HT3-1/Bert's	8/19/88	19.8	4.80	0.0120
	9/1/88	17.0	8.20	0.0000
	9/15/88	15.2	9.00	0.0000
	9/30/88	12.5	7.40	0.0006
	10/13/88	6.5	10.90	0.0012
	10/29/88	6.0	13.80	0.0129
	11/9/88	5.8	13.20	0.0450
	11/28/88	4.5	10.20	0.0786
	12/10/88	3.2	11.20	0.0285
	12/22/88	2.2	11.80	0.0177
	1/6/89	1.0	11.80	0.0402
	1/23/89	2.2	12.30	0.0414
M-1	8/17/88	21.9	9.65	0.2902
	8/31/88	14.8	11.40	0.3009
	9/15/88	15.5	11.10	0.2450
	9/29/88	17.5	8.75	0.4620
	10/15/88	12.5	12.10	0.4161
	10/27/88	5.0	14.20	0.7396
	11/9/88	7.0	12.00	1.4400
	11/25/88	6.0	12.60	1.2110
	12/8/88	4.0	14.20	0.7607
	12/22/88	2.5	14.70	0.7171
	1/10/89	4.0	16.30	1.8033
	1/19/89	3.5	14.80	0.8090

Temp and Dissolved Oxygen Readings
and Calculated Discharge
Gelman Sciences Stream Studies

M-2	8/17/88	21.6	7.74	0.1909
	8/31/88	12.9	9.50	0.2230
	9/15/88	13.5	9.50	0.1930
	9/29/88	16.0	8.30	0.3330
	10/15/88	14.0	11.00	0.3228
	10/27/88	4.0	13.00	0.6208
	11/9/88	7.0	11.00	1.1546
	11/25/88	7.5	10.40	0.8792
	12/8/88	3.5	13.20	0.5698
	12/22/88	3.5	14.20	0.4676
	1/10/89	3.0	16.70	0.9982
	1/19/89	3.5	12.70	0.6253
M-3	8/17/88	22.3	7.22	0.0674
	8/31/88	14.8	9.80	0.0758
	9/15/88	13.0	10.00	0.0752
	9/29/88	16.0	8.00	0.1030
	10/15/88	11.0	10.60	0.1139
	10/27/88	4.0	13.40	0.2195
	11/9/88	5.5	12.20	0.3805
	11/25/88	5.5	12.20	0.3062
	12/8/88	3.5	14.00	0.2227
	12/22/88	3.5	N/A	0.2227
	1/7/89	3.0	14.90	0.2542
	1/19/89	3.0	14.60	0.2231
MT1-1	8/17/88	18.6	7.20	0.0173
	8/31/88	15.2	13.00	0.0220
	9/15/88	17.5	10.80	0.0230
	9/29/88	18.5	9.20	0.0300
	10/15/88	16.0	10.40	0.0293
	10/27/88	5.0	13.20	0.0728
	11/9/88	6.5	10.60	0.2775
	11/25/88	7.0	11.40	0.2526
	12/8/88	4.5	14.00	0.1103
	12/22/88	4.0	13.10	0.0679
	1/10/89	3.0	13.20	0.4722
	1/19/89	4.0	12.60	0.1415

Temp and Dissolved Oxygen Readings
and Calculated Discharge
Gelman Sciences Stream Studies

MT1-2	8/17/88	19.8	5.30	0.0071
	8/31/88	12.9	10.14	0.0098
	9/15/88	14.5	10.70	0.0040
	9/29/88	17.75	7.30	0.0150
	10/15/88	15.0	10.20	0.0148
	10/27/88	4.5	13.00	0.0609
	11/9/88	6.0	11.40	0.3417
	11/27/88	8.0	9.20	0.2021
	12/8/88	3.5	15.00	0.0718
	12/22/88	3.0	14.60	0.0499
	1/10/89	3.0	13.70	0.3765
	1/19/89	2.5	13.20	0.1075
MT1-3	8/17/88	21.5	7.49	0.0037
	8/31/88	14.4	10.50	0.0043
	9/15/88	13.2	5.80	0.00002
	9/29/88	18.5	8.40	0.0060
	10/15/88	12.5	6.20	0.0013
	10/27/88	4.0	11.40	0.0085
	11/9/88	6.5	8.80	0.0316
	11/27/88	8.5	7.20	0.0267
	12/8/88	3.0	12.50	0.0145
	12/22/88	3.0	12.60	0.0075
	1/10/89	3.0	13.80	0.1990
	1/19/89	3.5	13.00	0.0166
MT2-1	8/17/88	19.3	6.52	0.008231
	8/31/88	13.0	9.60	0.0094
	9/15/88	13.5	9.20	0.0030
	9/29/88	17.5	6.80	0.0220
	10/15/88	13.5	10.00	0.0160
	10/27/88	4.5	13.00	0.0740
	11/9/88	6.0	11.00	0.4185
	11/25/88	6.0	11.60	0.2870
	12/8/88	3.0	14.60	0.0932
	12/22/88	2.0	14.60	0.0586
	1/10/89	3.0	14.20	0.5426
	1/19/89	2.0	13.80	0.1285

MT3-1	8/17/88	20.5	7.25	0.0087
	8/31/88	12.2	9.30	0.0124
	9/15/88	13.0	9.80	0.0110
	9/29/88	16.5	7.80	0.0150
	10/15/88	13.5	10.20	0.0091
	10/27/88	4.5	14.00	0.0423
	11/9/88	6.0	11.60	0.1314
	11/25/88	6.0	12.00	0.0839
	12/8/88	3.0	13.40	0.0389
	12/22/88	3.5	13.40	0.0300
	1/10/89	2.0	16.90	0.1393
	1/19/89	2.0	13.50	0.0540
MT4-1	8/17/88	22.8	9.47	0.1474
	8/31/88	11.3	11.50	0.1150
	9/15/88	13.5	11.20	0.1070
	9/29/88	14.5	8.70	0.2060
	10/15/88	13.5	10.60	0.1866
	10/27/88	5.5	13.00	0.2729
	11/9/88	7.0	10.20	0.6964
	11/25/88	7.0	10.60	0.4005
	12/8/88	5.0	12.40	0.2540
	12/22/88	5.0	12.50	0.2236
	1/7/89	6.0	13.10	0.2485
	1/19/89	4.0	14.10	0.3246
MT4-2	8/17/88	20.8	6.49	0.0139
	8/31/88	13.5	8.40	0.0095
	9/15/88	12.5	9.60	0.0120
	9/29/88	14.0	8.10	0.0160
	10/15/88	14.0	9.20	0.0181
	10/27/88	4.0	12.40	0.0169
	11/9/88	7.5	9.80	0.0457
	11/25/88	8.0	9.70	0.0498
	12/8/88	6.0	11.20	0.0368
	12/22/88	6.5	9.60	0.0313
	1/7/89	7.0	11.20	0.0316
	1/19/89	5.0	11.60	0.0399

Notes --: reflects that the necessary data is presently not available to complete calculations.

N/A: reflects that calculations are not applicable based on a zero discharge (i.e. no water in stream at time of sampling) or inability to measure discharge effectively (i.e. water significantly beyond normal stream bed or stream completely frozen over).

APPENDIX C

SURFACE WATER QUALITY DATA

APPENDIX C1

HONEY CREEK WATERSHED
SURFACE WATER QUALITY

703

Braithwaite Consultants, Inc.

MAR 7 1988

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

February 29, 1988

Dr. Paul Chalmer
Gelman Sciences, Inc.
600 S. Wagner Road
Ann Arbor, MI 48103

Dear Paul:

Enclosed with this letter please find the final data report for the eight Honey Creek stream samples collected on December 11, 1987. The tetrahydrofuran data have now been added.

Please call me if you have any questions or comments concerning this data.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Mary D. Bennett

Mary D. Bennett

slw

cc: Mr. James Braithwaite, Braithwaite Consultants, Inc. ✓

e29322

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date January 6, 1988

Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	HC-1 12-11-87	HC-2 12-11-87	HC-3 12-11-87	HC-4 12-11-87	HC-5 12-11-87	HC-6 12-11-87	HC-7 12-11-87	HC-8 12-11-87
pH	S.U.	7.96	8.10	8.23	8.09	8.11	8.21	7.83	8.02
Total Alkalinity	mg/l as $CaCO_3$	200	240	240	240	240	240	230	230
Temperature	°C*	5	5	3	5	5	5	4	4
Specific Conductance	$\frac{\text{umhos}}{\text{cm}}$* @ 25°C	760	820	840	860	850	850	780	840
Dissolved Oxygen	mg/l	11.19	11.56	11.15	11.53	12.19	12.58	9.49	10.57
Total Residual Chlorine	mg/l	0.03	0.01	0.03	0.03	0.02	0.02	0.05	0.06
BOD-5	mg/l	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/l	19	18	19	27	18	32	52	44
Total Organic Carbon	mg/l	10	13	16	19	17	16	79	21
Total Suspended Solids	mg/l	4	2	2	3	1	5	7	4

*Determined in field.

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29322

Data Summary Sheet

Date January 6, 1988

Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	HC-1 12-11-87	HC-2 12-11-87	HC-3 12-11-87	HC-4 12-11-87	HC-5 12-11-87	HC-6 12-11-87	HC-7 12-11-87	HC-8 12-11-87
Total Dissolved Solids	mg/l	440	460	500	520	480	510	540	510
Turbidity	NTU	5	3	0.8	4	3	4	3	2
Chloride	mg/l	77	80	80	73	72	73	32	41
Sulfate	mg/l	51	66	68	200	100	100	130	160
Total Kjeldahl Nitrogen	mg/l	<1	<1	<1	<1	<1	<1	1	1
Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate+ Nitrite-Nitrogen	mg/l	0.09	0.29	0.82	0.90	1.2	1.3	2.0	2.1
Total Phosphorus	mg/l	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Soluble Ortho-Phosphate-P	mg/l	<0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	0.01
Calcium	mg/l	74	87	95	100	98	95	100	110
Magnesium	mg/l	24	32	35	37	34	33	33	33

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29322

Data Summary Sheet

Date January 6, 1988 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	HC-1 12-11-87	HC-2 12-11-87	HC-3 12-11-87	HC-4 12-11-87	HC-5 12-11-87	HC-6 12-11-87	HC-7 12-11-87	HC-8 12-11-87
Sodium	mg/l	51	41	34	39	34	34	10	11
Potassium	mg/l	3.4	3.2	3.3	2.8	2.7	2.7	2.1	2.9
Total Iron	mg/l	0.53	0.40	0.04	0.50	0.41	0.46	0.59	0.43
Soluble Iron	mg/l	0.09	0.06	0.02	0.02	0.16	0.13	0.28	0.
Arsenic	mg/l	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001
Copper	mg/l	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.002
Cadmium	mg/l	0.0001	0.0002	0.0001	0.0002	0.0001	0.0001	0.0002	0.0002
Chromium	mg/l	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.002
Lead	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/l	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	mg/l	0.0007	0.0004	0.0013	0.0009	0.0009	0.0004	0.0008	0.0008

Sheet 3 of 4

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29322

Data Summary Sheet

Date January 6, 1988 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	HC-1 12-11-87	HC-2 12-11-87	HC-3 12-11-87	HC-4 12-11-87	HC-5 12-11-87	HC-6 12-11-87	HC-7 12-11-87	HC-8 12-11-87
Zinc	mg/l	0.012	0.011	0.005	0.004	<0.002	<0.002	0.005	0.002
Grease and Oil	mg/l	<2	<2	<2	<2	<2	<2	<2	<2
Total Cyanide	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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29322

Data Summary Sheet

Date December 21, 1987 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		HC-1 12-11-87	HC-2 12-11-87	HC-3 12-11-87	HC-4 12-11-87	HC-5 12-11-87	HC-6 12-11-87	
1,4-Dioxane	mg/l		0.052	0.036	<0.001	0.008	0.007	0.007	
Tetrahydro-furan	mg/l		0.034	<0.001	<0.001	<0.001	<0.001	<0.001	

Sheet 1 of 2

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29322

Data Summary Sheet

Date December 21, 1957 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		HC-7 12-11-87	HC-8 12-11-87	Field Blank 12-11-87				
1,4-Dioxane	mg/l		<0.001	<0.001	<0.001				
Tetrahydro-furan	mg/l		<0.001	<0.001	<0.001				

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29327
Sample ID HC-1
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625 DATA SUMMARY SHEET

or: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-1
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorene (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29327
Sample ID HC-1
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

r: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-2
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethene (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-2
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

r: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-2
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 2937
Sample ID HC-3
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625 DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-3
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 2932
Sample ID HC-3
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-4
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 2932
Sample ID HC-4
Collection Data 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-4
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-5
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-5
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 2932
Sample ID HC-5
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-6
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 2932.
Sample ID HC-6
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-6
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-8)	mg/L	<0.01	0.0.
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-7
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625 DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-7
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorene (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29327
Sample ID HC-7
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

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USEPA METHOD 624
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-8
Collection Date 12/11/87
Received by ATS 12/11/87

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-8
Collection Date 12/11/87
Received by ATS 12/11/87

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: PAUL CHALMER

Project GELMAN SCIENCES / 29322
Sample ID HC-8
Collection Date 12/11/87
Received by ATS 12/11/87

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-8)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	-	-	-
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<0.01	0.01

Ann Arbor
Technical Services, Inc.
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October 19, 1988

Mr. Tim Rienke
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed with this letter please find a table of test results for 23 water samples collected from Honey Creek on August 18 and 19, 1988. These samples pertain to the Gelman Sciences project.

Please call if you have any questions regarding these results.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Ed Paulson

Ed Paulson

slw

Enclosure

#28322

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0998

29322

Data Summary Sheet

Date October 14, 1988 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	M-1 8-18-88	M-2 8-18-88	M-2A 8-18-88	M-3 8-18-88	M-4 8-18-88	M-5 8-18-88	M-6 8-18-88	M-7 8-18-88
1,4-Dioxane	mg/l	<0.001	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001

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Data Summary Sheet

Date October 14, 1988 Project Gelman Sciences, Inc.

Sample I.D./Sample Data

Parameter	Units	M-8 8-18-88	M-9 8-18-88	M-10 8-18-88	MT1-1 8-18-88	MT1-2 8-19-88	MT1-3 8-19-88	MT1-4 8-19-88	MT1-5 8-19-88
1,4-Dioxane	mg/l	<0.001	<0.001	<0.001	0.009	0.013	0.017	<0.001	0.006

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Data Summary Sheet

Date October 14, 1988 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		HT1-6 8-19-88	HT1-7 8-19-88	HT2-1 8-18-88	HT2-2 8-19-88	HT3-1 8-19-88	Field Blank 8-17-88	Field Blank 8-18-88
1,4-Dioxane	mg/l		0.006	0.022	<0.001	0.015	<0.001	<0.001	<0.001

Sheet 1 of 1

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Data Summary Sheet

Date October 25, 1988 Project Gelman Sciences, Inc.

Parameter	Units	Sample I.D./Sample Date: H-9 9-15-88	H-10 9-15-88	HT1-1 9-15-88	HT1-2 9-15-88	HT1-3 9-15-88	HT1-4 9-15-88	HT1-5 9-15-88	HT1-5 Duplicate 9-15-88
1,4-Dioxane	mg/l	<0.001	<0.001	0.013	0.018	0.035	<0.001	0.001	0.001

Ann Arbor Technical Services, Inc.
6640 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0996

29322

Data Summary Sheet

Date October 25, 1988 Project Gelman Sciences, Inc.

Sample I.D./Sample Date

Parameter	Units		HT1-6 9-15-88	HT1-7 9-15-88	HT2-1 9-15-88	HT3-1 9-15-88	Trip Blank 9-14-88		
1,4-Dioxane	mg/l		0.001	0.035	<0.001	0.002	<0.001		

Sheet 3 of 3

NOV 15 1988

Ann Arbor
Technical Services, Inc.
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November 10, 1988

Mr. Tim Rienks
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed with this letter please find a table of test results for 23 water samples collected on October 14, 1988 and one sample collected on August 18, 1988 from Honey Creek. These samples pertain to the Gelman Sciences project.

Please call if you have any questions regarding these results.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Ed Paulson

Ed Paulson

slw

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29322

Data Summary Sheet

Date November 2, 1988 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-1 10-14-88	H-2 10-14-88	H-3 10-14-88	H-4 10-14-88	H-5 10-14-88	H-6 10-14-88	H-7 10-14-88	H-8 10-14-88
1,4-Dioxane	mg/l	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001

Sheet 1 of 3

Ann Arbor Technical Services, Inc.
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Data Summary Sheet

Date November 2, 1988 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-9 10-14-88	H-10 10-14-88	HT1-1 10-14-88	HT1-2 10-14-88	HT1-3 10-14-88	HT1-4 10-14-88	HT1-5 10-14-88	HT1-5 Duplicate 10-14-88
1,4-Dioxane	mg/l	<0.001	<0.001	0.014	0.017	0.028	0.002	0.024	0.022

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Data Summary Sheet

Date November 2, 1988

Project Gelman Sciences, Inc.

Sample I.D./Sample Date

Parameter	Units		HT1-6 10-14-88	HT1-7 10-14-88	HT2-1 10-14-88	HT2-2 10-14-88	HT3-1 10-14-88	Field Blank 10-13-88	
1,4-Dioxane	mg/l		0.025	0.28	<0.001	0.023	0.001	<0.001	

Sheet 1 of 1

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Data Summary Sheet

Date October 25, 1988

Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
					HT3-1 8-18-88				
1,4-Dioxane	mg/l				<0.001				

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Client

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Ann Arbor
Technical Services, Inc.
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January 10, 1989

Mr. Tim Rienks
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed with this letter please find a table of test results for 22 water samples collected from Honey Creek on November 9, 10 and 11, 1988. These samples pertain to the Gelman Sciences project.

Please call if you have any questions regarding these results.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Ed Paulson

Ed Paulson

slw

Enclosure

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29322

Data Summary Sheet

Date January 5, 1989 Project Gelman Sciences, Inc.

Sample I.D./Sample Date

Parameter	Units	H-1 11-11-88	H-2 11-11-88	H-3 11-10-88	H-4 11-11-88	H-5 11-10-88	H-6 11-9-88	H-7 11-9-88	H-8 11-9-88
1,4-Dioxane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Sheet 1 of 3

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29322

Data Summary Sheet

Date January 5, 1989 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-9 11-9-88	H-10 11-9-88	HT1-1 11-10-88	HT1-2 11-10-88	HT1-3 11-9-88	HT1-4 11-10-88	HT1-5 11-10-88	HT1-6 11-10-88
1,4-Dioxane	mg/l	<0.001	<0.001	0.001	0.003	0.007	<0.001	0.001	0.001

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Data Summary Sheet

Date January 5, 1989 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		HT1-7 Upstream 11-10-88	HT1-7 Midstream 11-10-88	HT2-1 11-11-88	HT2-2 11-9-88	HT3-1 11-9-88	Field Blank 11-9-88	
1,4-Dioxane	mg/l		<0.001	0.001	<0.001	0.030	<0.001	<0.001	

Sheet 3 of 3

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

February 9, 1989

Mr. Tim Rienks
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed with this letter please find a table of test results for 21 water samples collected from Honey Creek on December 10 and 11, 1988 and 22 water samples collected from Honey Creek on January 5 and 6, 1989.

Please call if you have any questions regarding these results.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Ed Paulson

Ed Paulson

slw

Enclosure

•29322

Ann Arbor Technical Services, Inc.
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29322

Data Summary Sheet

Date February 8, 1989

Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-1 12/10/88	H-2 12/10/88	H-3 12/10/88	H-4 12/10/88	H-5 12/11/88	H-6 12/11/88	H-7 12/10/88	H-8 12/10/88
1,4-Dioxane	mg/l	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001

Ann Arbor Technical Services, Inc.
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29322

Data Summary Sheet

Date February 8, 1989 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-9 12/11/88	H-10 12/11/88	HT1-1 12/11/88	HT1-2 12/11/88	HT1-3 12/11/88	HT1-4 12/11/88	HT1-5 12/11/88	HT1-6 12/11/88
1,4-Dioxane	mg/l	<0.001	<0.001	0.010	0.014	0.019	0.012	0.026	0.038

Ann Arbor Technical Services, Inc.
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29322

Data Summary Sheet

Date February 8, 1989 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		HT1-7 12/11/88	HT2-1 12/11/88	HT2-2 12/11/88	HT3-1 12/11/88	Field Blank 12/9/88		
1,4-Dioxane	mg/l		0.035	<0.001	0.042	<0.001	<0.001		

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29322

Data Summary Sheet

Date February 8, 1989 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-1 1/5/89	H-2 1/5/89	H-3 1/5/89	H-4 1/5/89	H-5 1/5/89	H-6 1/5/89	H-7 1/6/89	H-8 1/5/89
1,4-Dioxane	mg/l	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date February 8, 1989 Project Gelman Sciences, Inc.

		Sample I.D./Sample Date							
Parameter	Units	H-9 1/6/89	H-10 1/6/89	HT1-1 1/5/89	HT1-2 1/6/89	HT1-3 1/6/89	HT1-3 Duplicate 1/6/89	HT1-4 1/6/89	HT1-5 1/6/89
1,4-Dioxane	mg/l	<0.001	<0.001	0.007	0.012	0.016	0.013	0.009	0.019

Ann Arbor Technical Services, Inc.
8540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date February 8, 1989 Project Gelman Sciences, Inc.

Sample I.D./Sample Data

Parameter	Units		HT1-6 1/6/89	HT1-7 1/6/89	HT2-1 1/6/89	HT2-2 1/6/89	HT3-1 1/6/89	Field Blank 1/5/89	
1,4-Dioxane	mg/l		0.025	0.033	0.002	0.038	<0.001	<0.001	

APPENDIX C2

MILL CREEK WATERSHED
SURFACE WATER QUALITY

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

March 6, 1989

Mr. Tim Rienks
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed with this letter please find the remainder of the baseline screening of stream samples collected from Mill Creek during August, 1988. If you have any questions concerning these samples please call me.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Ed Paulson (slw)

Ed Paulson

slw

Enclosures

e29322

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-665-0995

29322

Data Summary Sheet

Date October 3, 1988

Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT1-1 8/17/88	MT1-2 8/17/88	MT1-3 8/17/88	MT2-1 8/17/88	MT3-1 8/17/88	MT4-1 8/17/88	
1,4-Dioxane	mg/l		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Tetrahydro-furan	mg/l		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Ann Arbor Technical Services, Inc.
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29322

Data Summary Sheet

Date October 3, 1989 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT4-2 8/17/88	MT4-2 Dup. 8/17/88	M-1 8/17/88	M-2 8/17/88	M-3 8/17/88	Field Blank 8/17/88	
1,4-Dioxane	mg/l		<0.001	<0.001	<0.001	<0.001	<0.001	-	
Tetrahydro-furan	mg/l		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Ann Arb
Technica. Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT1-1 8-17-88	MT1-2 8-17-88	MT1-3 8-17-88	MT2-1 8-17-88	MT3-1 8-17-88	MT4-1 8-17-88	
pH	S.U.		8.21	8.20	8.30	8.20	8.21	8.23	
Total Alkalinity	mg/l as $CaCO_3$		300	310	320	300	300	290	
Temperature	°C*		20	23	24	22	23	26	
Specific Conductance	umhos/cm @ 25°C*		740	920	940	630	720	720	
Dissolved Oxygen	mg/l*		7.20	5.30	7.49	6.52	7.25	9.47	
BOD-5	mg/l		3	<2	<2	<2	<2	<2	
Chemical Oxygen Demand	mg/l		25	17	11	14	25	20	
Total Organic Carbon	mg/l		6	5	6	3	6	5	
Total Suspended Solids	mg/l		32	16	6	12	28	16	
Total Dissolved Solids	mg/l		520	630	660	400	480	460	

*Determined in field.

Sheet 1 of 8

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

Parameter	Units		Sample I.D./Sample Date MT4-2 8-17-88	MT4-2 Dup. 8-17-88	M-1 8-17-88	M-2 8-17-88	M-3 8-17-88	Field Blank 8-17-88	
pH	S.U.		8.17	8.08	8.32	8.22	8.26	7.25	
Total Alkalinity	mg/l as $CaCO_3$		290	290	280	290	250	11	
Temperature	°C*		23	23	24	24	25	25	
Specific Conductance	umhos*/cm @ 25°C		620	620	710	720	710	<10	
Dissolved Oxygen	mg/l*		6.49	-	9.65	7.74	7.22	-	
BOD-5	mg/l		<2	<2	<2	<2	<2	<2	
Chemical Oxygen Demand	mg/l		23	43	14	15	12	<5	
Total Organic Carbon	mg/l		8	8	5	5	4	<1	
Total Suspended Solids	mg/l		20	86	6	13	8	<1	
Total Dissolved Solids	mg/l		380	400	500	490	460	-	

*Determined in field.

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT1-1 8-17-88	MT1-2 8-17-88	MT1-3 8-17-88	MT2-1 8-17-88	MT3-1 8-17-88	MT4-1 8-17-88	
Turbidity	NTU		10	10	2	5	12	7	
Chloride	mg/l		35	77	70	12	20	16	
Sulfate	mg/l		52	64	76	32	56	76	
Total Kjeldahl Nitrogen	mg/l		1.8	0.2	0.5	0.4	0.5	0.4	
Ammonia Nitrogen	mg/l		0.11	0.09	0.03	0.05	0.05	0.06	
Nitrate+ Nitrite- Nitrogen	mg/l		0.20	0.69	2.4	0.27	0.47	0.57	
Total Phosphorus	mg/l		0.15	0.11	0.10	0.11	0.12	0.10	
Calcium	mg/l		97	120	120	85	100	100	
Magnesium	mg/l		40	40	42	38	38	39	
Sodium	mg/l		20	32	20	10	8.0	6.4	

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29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

Parameter	Units		Sample I.D./Sample Date MT4-2 8-17-88	MT4-2 Dup. 8-17-88	M-1 8-17-88	M-2 8-17-88	M-3 8-17-88	Field Blank 8-17-88	
Turbidity	NTU		16	61	4	4	2	<1	
Chloride	mg/l		7	8	27	28	56	<1	
Sulfate	mg/l		40	40	60	64	40	<1	
Total Kjeldahl Nitrogen	mg/l		0.9	0.9	0.2	0.2	0.1	0.2	
Ammonia Nitrogen	mg/l		0.10	0.12	<0.02	0.06	<0.02	0.03	
Nitrate+ Nitrite- Nitrogen	mg/l		0.15	0.16	0.40	0.44	0.23	<0.02	
Total Phosphorus	mg/l		0.07	0.20	0.10	0.07	0.05	<0.01	
Calcium	mg/l		96	93	95	93	81	<1	
Magnesium	mg/l		34	32	38	36	34	<0.1	
Sodium	mg/l		4.0	4.0	13	14	29	<0.1	

Ann Arbor Technical Services, Inc.
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29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT1-1 8-17-88	MT1-2 8-17-88	MT1-3 8-17-88	MT2-1 8-17-88	MT3-1 8-17-88	MT4-1 8-17-88	
Potassium	mg/l		5.2	5.2	7.9	2.3	2.1	2.1	
Iron	mg/l		3.3	0.86	0.24	1.0	2.9	1.0	
Arsenic	mg/l		0.002	0.002	0.002	0.005	0.006	0.004	
Copper	mg/l		0.002	0.003	0.002	0.002	0.002	0.003	
Cadmium	mg/l		0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	
Chromium	mg/l		0.001	0.001	<0.001	0.001	0.002	0.001	
Lead	mg/l		0.002	0.001	<0.001	0.001	0.002	0.001	
Nickel	mg/l		<0.01	<0.01	0.01	0.01	<0.01	<0.01	
Mercury	mg/l		<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0003	
Zinc	mg/l		0.007	0.008	0.001	0.006	0.014	0.015	

Sheet 5 of 8

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date: September 30, 1988 Project: Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT1-1 8-17-88	MT1-2 8-17-88	MT1-3 8-17-88	MT2-1 8-17-88	MT3-1 8-17-88	MT4-1 8-17-88	
Total Cyanide	mg/l		<0.01	<0.01	0.02	<0.01	<0.01	<0.01	

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

Parameter	Units		Sample I.D./Sample Date MT4-2 8-17-88	MT4-2 Dup. 8-17-88	M-1 8-17-88	M-2 8-17-88	M-3 8-17-88	Field Blank 8-17-88	
Potassium	mg/l		2.1	1.8	1.9	1.8	1.7	<0.1	
Iron	mg/l		3.8	16	0.48	0.82	0.64	<0.02	
Arsenic	mg/l		0.003	0.009	0.003	0.003	0.002	<0.001	
Copper	mg/l		0.001	0.004	0.001	0.002	0.001	<0.001	
Cadmium	mg/l		<0.0001	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	mg/l		0.001	0.002	0.001	0.001	0.001	<0.001	
Lead	mg/l		<0.001	0.004	<0.001	0.001	<0.001	<0.001	
Nickel	mg/l		<0.01	<0.01	0.01	<0.01	0.01	<0.01	
Mercury	mg/l		<0.0001	0.0001	<0.0001	<0.0001	0.0005	<0.0001	
Zinc	mg/l		0.008	0.017	0.014	0.005	0.005	0.005	

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

29322

Data Summary Sheet

Date September 30, 1988 Project Gelman Sciences, Inc.

			Sample I.D./Sample Date						
Parameter	Units		MT4-2 8-17-88	MT4-2 Dup. 8-17-88	M-1 8-17-88	M-2 8-17-88	M-3 8-17-88	Field Blank 8-17-88	
Total Cyanide	mg/l		<0.01	<0.01	0.01	<0.01	<0.01	<0.01	

Sheet 8 of 8

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0905

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 2937
Sample ID FIELD BLANK
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

24VLS

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

December 12, 1988

Mr. Tim Rienks
Braithwaite Consultants, Inc.
3928 Varsity Drive
Ann Arbor, MI 48108

Dear Tim:

Enclosed please find the results of baseline organics screening of stream samples collected from Mill Creek during August, 1988, as part of the Gelman Sciences stream study. If you have any questions, please contact Ed or myself.

Very truly yours,

ANN ARBOR TECHNICAL SERVICES, INC.

Philip B. Simon
Director of Chemistry

slw

Enclosures

e29322

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID M-1
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2888L1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0995

USEPA METHOD 624 DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 32
Sample ID M-1
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detectio Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLB

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID FIELD BLANK
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

ZSAL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-665-0995

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID FIELD BLANK
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	ug/L	<0.01	0.01
Acenaphthylene (208-96-8)	ug/L	<0.01	0.01
Anthracene (120-12-7)	ug/L	<0.01	0.01
Benzidine (92-87-5)	ug/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	ug/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	ug/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	ug/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	ug/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	ug/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	ug/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	ug/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	ug/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	ug/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	ug/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	ug/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	ug/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	ug/L	<0.01	0.01
Chrysene (218-01-9)	ug/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	ug/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	ug/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	ug/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	ug/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	ug/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	ug/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	ug/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	ug/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	ug/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	ug/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	ug/L	<0.01	0.01
Fluoranthene (206-44-0)	ug/L	<0.01	0.01
Fluorene (86-73-7)	ug/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	ug/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	ug/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	ug/L	<0.01	0.01
Hexachloroethane (67-72-1)	ug/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	ug/L	<0.01	0.01
Isophorone (78-59-1)	ug/L	<0.01	0.01
Naphthalene (91-20-3)	ug/L	<0.01	0.01
Nitrobenzene (98-95-3)	ug/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	ug/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	ug/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	ug/L	<0.01	0.01
Phenanthrene (85-01-8)	ug/L	<0.01	0.01
Pyrene (129-00-0)	ug/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	ug/L	<0.01	0.01

2986J

Ann Arbor Technical Services, Inc.
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USEPA METHOD 625 DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID M-1
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

2BAL1

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0966

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID M-2
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLS

Ann Arbor Technical Services, Inc.
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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID M-2
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2581

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

USEPA METHOD 625

DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322

Sample ID M-2

Collection Date 8/17/88

Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

2SAL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID M-3
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detectic Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLG

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID M-3
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2SSL1

Ann Arbor Technical Services, Inc.
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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID M-3
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

2SAL1

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USEPA METHOD 624

DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322

Sample ID MT1-1

Collection Date 8/17/88

Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLS

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT1-1
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

258L1

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DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT1-1
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

28AL1

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USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID MT1-2
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detecti Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

24VLS

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT1-2
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2881.1

Ann Arbor Technical Services, Inc.
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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT1-2
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

2SAL1

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6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-665-0666

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID MT1-3
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	mg/L	<0.005	0.005
Bromodichloromethane (75-27-4)	mg/L	<0.005	0.005
Bromoform (75-25-2)	mg/L	<0.005	0.005
Bromomethane (74-83-9)	mg/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	mg/L	<0.005	0.005
Chlorobenzene (108-90-7)	mg/L	<0.005	0.005
Chloroethane (75-00-3)	mg/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	mg/L	<0.01	0.01
Chloroform (67-66-3)	mg/L	<0.005	0.005
Chloromethane (74-87-3)	mg/L	<0.01	0.01
Dibromochloromethane (124-48-1)	mg/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	mg/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	mg/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	mg/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	mg/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	mg/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	mg/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	mg/L	<0.005	0.005
Ethylbenzene (100-41-4)	mg/L	<0.005	0.005
Methylene Chloride (75-09-2)	mg/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	mg/L	<0.005	0.005
Tetrachloroethene (127-18-4)	mg/L	<0.005	0.005
Toluene (108-88-3)	mg/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	mg/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	mg/L	<0.005	0.005
Trichloroethene (79-01-6)	mg/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	mg/L	<0.005	0.005
Vinyl Chloride (75-01-4)	mg/L	<0.01	0.01

24VLS

Ann Arbor Technical Services, Inc.

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322

Sample ID MT1-3

Collection Date 8/17/88

Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	ug/L	<0.01	0.01
Acenaphthylene (208-96-8)	ug/L	<0.01	0.01
Anthracene (120-12-7)	ug/L	<0.01	0.01
Benzidine (92-87-5)	ug/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	ug/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	ug/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	ug/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	ug/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	ug/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	ug/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	ug/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	ug/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	ug/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	ug/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	ug/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	ug/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	ug/L	<0.01	0.01
Chrysene (218-01-9)	ug/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	ug/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	ug/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	ug/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	ug/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	ug/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	ug/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	ug/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	ug/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	ug/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	ug/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	ug/L	<0.01	0.01
Fluoranthene (206-44-0)	ug/L	<0.01	0.01
Fluorene (86-73-7)	ug/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	ug/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	ug/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	ug/L	<0.01	0.01
Hexachloroethane (67-72-1)	ug/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	ug/L	<0.01	0.01
Isophorone (78-59-1)	ug/L	<0.01	0.01
Naphthalene (91-20-3)	ug/L	<0.01	0.01
Nitrobenzene (98-95-3)	ug/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	ug/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	ug/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	ug/L	<0.01	0.01
Phenanthrene (85-01-8)	ug/L	<0.01	0.01
Pyrene (129-00-0)	ug/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	ug/L	<0.01	0.01

2686L1

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT1-3
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	ug/L	<0.01	0.01
2-Chlorophenol (95-57-8)	ug/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	ug/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	ug/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	ug/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	ug/L	<0.1	0.1
2-Nitrophenol (88-75-5)	ug/L	<0.01	0.01
4-Nitrophenol (100-02-7)	ug/L	<0.01	0.01
Pentachlorophenol (87-86-5)	ug/L	<0.01	0.01
Phenol (108-95-2)	ug/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	ug/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	ug/L	<0.01	0.01
beta-BHC (319-85-7)	ug/L	<0.01	0.01
delta-BHC (319-86-8)	ug/L	<0.01	0.01
Chlordane (57-74-9)	ug/L	<1	1
4,4'-DDD (72-54-8)	ug/L	<0.01	0.01
4,4'-DDE (72-55-9)	ug/L	<0.01	0.01
4,4'-DDT (50-29-3)	ug/L	<0.01	0.01
Dieldrin (60-57-1)	ug/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	ug/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	ug/L	<0.01	0.01
Heptachlor (76-44-8)	ug/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	ug/L	<0.01	0.01
PCB-1016 (12674-11-2)	ug/L	<0.01	0.01
PCB-1221 (11104-28-2)	ug/L	<0.05	0.05
PCB-1232 (11141-16-5)	ug/L	<0.01	0.01
PCB-1242 (53469-21-9)	ug/L	<0.01	0.01
PCB-1248 (12672-29-6)	ug/L	<0.01	0.01
PCB-1254 (11097-69-1)	ug/L	<0.01	0.01
PCB-1260 (11096-82-5)	ug/L	<0.01	0.01
Toxaphene (8001-35-2)	ug/L	<1	1

2BAL1

Ann Arbor Technical Services, Inc.
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USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID MT2-1
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detectic Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLS

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Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT2-1
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2884.1

Ann Arbor Technical Services, Inc.
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USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 293
Sample ID MT4-2 DUPLICATE
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLB

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-2 DUPLICATE
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2688L1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0999

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-2
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-9)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2SBL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0995

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-2
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

28AL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-1
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

25AL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 2932
Sample ID MT4-2
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLS

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0999

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT2-1
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

2GAL1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 2932'
Sample ID MT3-1
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detection Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

24VLS

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0995

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT3-1
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

2686L1

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-996-0996

USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT3-1
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

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USEPA METHOD 624
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 2932
Sample ID MT4-1
Collection Date 8/17/88
Received by ATS 8/17/88

Volatile Organics (CAS#)	Units	Conc.	Detectio Limit
Benzene (71-43-2)	ug/L	<0.005	0.005
Bromodichloromethane (75-27-4)	ug/L	<0.005	0.005
Bromoform (75-25-2)	ug/L	<0.005	0.005
Bromomethane (74-83-9)	ug/L	<0.01	0.01
Carbon Tetrachloride (56-23-5)	ug/L	<0.005	0.005
Chlorobenzene (108-90-7)	ug/L	<0.005	0.005
Chloroethane (75-00-3)	ug/L	<0.01	0.01
2-Chloroethyl Vinyl Ether (110-75-8)	ug/L	<0.01	0.01
Chloroform (67-66-3)	ug/L	<0.005	0.005
Chloromethane (74-87-3)	ug/L	<0.01	0.01
Dibromochloromethane (124-48-1)	ug/L	<0.005	0.005
1,1-Dichloroethane (75-34-3)	ug/L	<0.005	0.005
1,2-Dichloroethane (107-06-2)	ug/L	<0.005	0.005
1,1-Dichloroethene (75-35-4)	ug/L	<0.005	0.005
trans-1,2-Dichloroethene (156-60-5)	ug/L	<0.005	0.005
1,2-Dichloropropane (78-87-5)	ug/L	<0.005	0.005
cis-1,3-Dichloropropene (10061-01-5)	ug/L	<0.005	0.005
trans-1,3-Dichloropropene (10061-02-6)	ug/L	<0.005	0.005
Ethylbenzene (100-41-4)	ug/L	<0.005	0.005
Methylene Chloride (75-09-2)	ug/L	<0.005	0.005
1,1,2,2-Tetrachloroethane (79-34-5)	ug/L	<0.005	0.005
Tetrachloroethene (127-18-4)	ug/L	<0.005	0.005
Toluene (108-88-3)	ug/L	<0.005	0.005
1,1,1-Trichloroethane (71-55-6)	ug/L	<0.005	0.005
1,1,2-Trichloroethane (79-00-5)	ug/L	<0.005	0.005
Trichloroethene (79-01-6)	ug/L	<0.005	0.005
Trichlorofluoromethane (75-69-4)	ug/L	<0.005	0.005
Vinyl Chloride (75-01-4)	ug/L	<0.01	0.01

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USEPA METHOD 625
DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-1
Collection Date 8/17/88
Received by ATS 8/17/88

Base-Neutral Extractables (CAS#)	Units	Conc.	Detection Limit
Acenaphthene (83-32-8)	mg/L	<0.01	0.01
Acenaphthylene (208-96-8)	mg/L	<0.01	0.01
Anthracene (120-12-7)	mg/L	<0.01	0.01
Benzidine (92-87-5)	mg/L	<0.1	0.1
Benzo(a)anthracene (56-55-3)	mg/L	<0.01	0.01
Benzo(b)fluoranthene (205-99-2)	mg/L	<0.01	0.01
Benzo(k)fluoranthene (207-08-9)	mg/L	<0.01	0.01
Benzo(ghi)perylene (191-24-2)	mg/L	<0.01	0.01
Benzo(a)pyrene (50-32-8)	mg/L	<0.01	0.01
Bis(2-chloroethoxy) methane (111-91-1)	mg/L	<0.01	0.01
Bis(2-chloroethyl) Ether (111-44-4)	mg/L	<0.01	0.01
Bis(2-chloroisopropyl) Ether (108-60-1)	mg/L	<0.01	0.01
Bis(2-ethylhexyl) Phthalate (117-81-7)	mg/L	<0.01	0.01
4-Bromophenyl Phenyl Ether (101-55-3)	mg/L	<0.01	0.01
Butyl Benzyl Phthalate (85-68-7)	mg/L	<0.01	0.01
2-Chloronaphthalene (91-58-7)	mg/L	<0.01	0.01
4-Chlorophenyl Phenyl Ether (7005-72-3)	mg/L	<0.01	0.01
Chrysene (218-01-9)	mg/L	<0.01	0.01
Dibenzo(a,h)anthracene (53-70-3)	mg/L	<0.01	0.01
Di-n-butyl Phthalate (84-74-2)	mg/L	<0.01	0.01
1,2-Dichlorobenzene (95-50-1)	mg/L	<0.01	0.01
1,3-Dichlorobenzene (541-73-1)	mg/L	<0.01	0.01
1,4-Dichlorobenzene (106-46-7)	mg/L	<0.01	0.01
3,3'-Dichlorobenzidine (91-94-1)	mg/L	<0.05	0.05
Diethyl Phthalate (84-66-2)	mg/L	<0.01	0.01
Dimethyl Phthalate (131-11-3)	mg/L	<0.01	0.01
2,4-Dinitrotoluene (121-14-2)	mg/L	<0.01	0.01
2,6-Dinitrotoluene (606-20-2)	mg/L	<0.01	0.01
Di-n-octyl Phthalate (117-84-0)	mg/L	<0.01	0.01
Fluoranthene (206-44-0)	mg/L	<0.01	0.01
Fluorene (86-73-7)	mg/L	<0.01	0.01
Hexachlorobenzene (118-74-1)	mg/L	<0.01	0.01
Hexachlorobutadiene (87-68-3)	mg/L	<0.01	0.01
Hexachlorocyclopentadiene (77-47-4)	mg/L	<0.01	0.01
Hexachloroethane (67-72-1)	mg/L	<0.01	0.01
Indeno(1,2,3-cd)pyrene (193-39-5)	mg/L	<0.01	0.01
Isophorone (78-59-1)	mg/L	<0.01	0.01
Naphthalene (91-20-3)	mg/L	<0.01	0.01
Nitrobenzene (98-95-3)	mg/L	<0.01	0.01
N-nitrosodimethylamine (62-75-9)	mg/L	<0.01	0.01
N-nitrosodiphenylamine (86-30-6)	mg/L	<0.01	0.01
N-nitroso-di-n-propylamine (621-64-7)	mg/L	<0.01	0.01
Phenanthrene (85-01-8)	mg/L	<0.01	0.01
Pyrene (129-00-0)	mg/L	<0.01	0.01
1,2,4-Trichlorobenzene (120-82-1)	mg/L	<0.01	0.01

28861

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USEPA METHOD 625 DATA SUMMARY SHEET

For: GELMAN SCIENCES

Project GELMAN SCIENCES / 29322
Sample ID MT4-2 DUPLICATE
Collection Date 8/17/88
Received by ATS 8/17/88

Acid Extractables (CAS#)	Units	Conc.	Detection Limit
4-Chloro-3-methylphenol (59-50-7)	mg/L	<0.01	0.01
2-Chlorophenol (95-57-8)	mg/L	<0.01	0.01
2,4-Dichlorophenol (120-83-2)	mg/L	<0.01	0.01
2,4-Dimethylphenol (105-67-9)	mg/L	<0.01	0.01
4,6-Dinitro-2-methylphenol (534-52-1)	mg/L	<0.05	0.05
2,4-Dinitrophenol (51-28-5)	mg/L	<0.1	0.1
2-Nitrophenol (88-75-5)	mg/L	<0.01	0.01
4-Nitrophenol (100-02-7)	mg/L	<0.01	0.01
Pentachlorophenol (87-86-5)	mg/L	<0.01	0.01
Phenol (108-95-2)	mg/L	<0.01	0.01
2,4,6-Trichlorophenol (88-06-2)	mg/L	<0.01	0.01

Pesticide Extractables (CAS#)	Units	Conc.	Detection Limit
Aldrin (309-00-2)	mg/L	<0.01	0.01
beta-BHC (319-85-7)	mg/L	<0.01	0.01
delta-BHC (319-86-8)	mg/L	<0.01	0.01
Chlordane (57-74-9)	mg/L	<1	1
4,4'-DDD (72-54-8)	mg/L	<0.01	0.01
4,4'-DDE (72-55-9)	mg/L	<0.01	0.01
4,4'-DDT (50-29-3)	mg/L	<0.01	0.01
Dieldrin (60-57-1)	mg/L	<0.01	0.01
Endosulfan Sulfate (1031-07-8)	mg/L	<0.01	0.01
Endrin Aldehyde (7421-93-4)	mg/L	<0.01	0.01
Heptachlor (76-44-8)	mg/L	<0.01	0.01
Heptachlor Epoxide (1024-57-3)	mg/L	<0.01	0.01
PCB-1016 (12674-11-2)	mg/L	<0.01	0.01
PCB-1221 (11104-28-2)	mg/L	<0.05	0.05
PCB-1232 (11141-16-5)	mg/L	<0.01	0.01
PCB-1242 (53469-21-9)	mg/L	<0.01	0.01
PCB-1248 (12672-29-6)	mg/L	<0.01	0.01
PCB-1254 (11097-69-1)	mg/L	<0.01	0.01
PCB-1260 (11096-82-5)	mg/L	<0.01	0.01
Toxaphene (8001-35-2)	mg/L	<1	1

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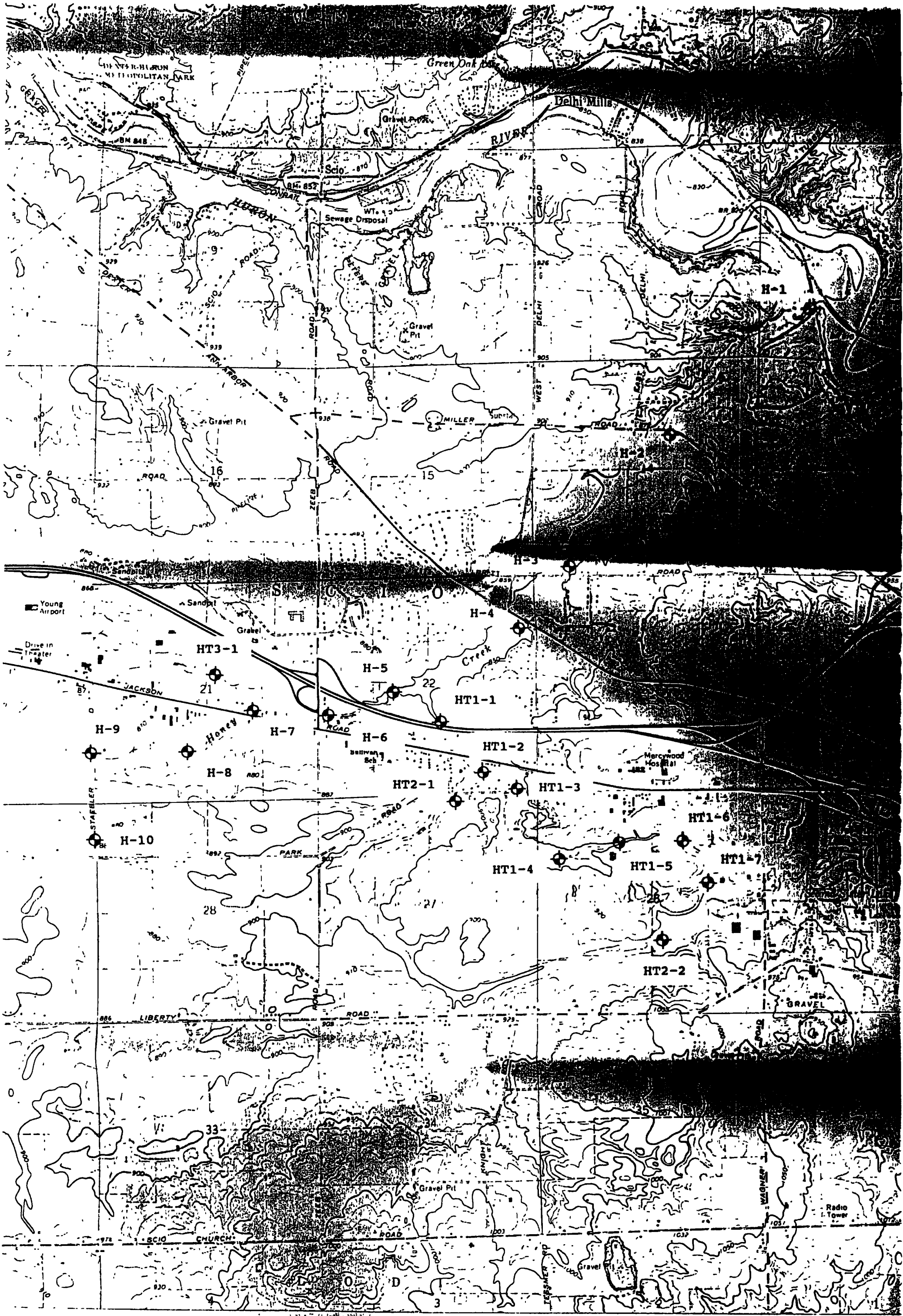
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PETERS CREEK
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Gravel Pit
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