FLUOR DANIEL GTI

DRAFT

FEASIBILITY STUDY REPORT

General Motors-Allison Gas Turbine Plant 10
700 North Olin Avenue
Indianapolis, Indiana

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Prepared For
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EXECUTIVE SUMMARY

Fluor Daniel GTI has prepared a Feasibility Study report for the former Allison Plant 10 located at 700 North Olin Avenue in Indianapolis, Indiana. This scope of work has been completed, when considered as a whole, to be consistent with the National Contingency Plan as referenced in 40 CFR 300.700 (Subpart H-Participation by Other Persons). The purpose of the study was to evaluate remediation cleanup goals for groundwater and soil, develop and screen possible remediation technologies, present results of treatability investigations, and provide a detailed analysis of selected remediation technologies.

Site-specific human health risks were calculated for the site using IDEM and Environmental Protection Agency (EPA) risk assessment methodology. No soil carcinogenic risks for non-residential exposures to soils exceeded the 1×10^{-5} target risk level. On-site soil contaminants of interest (COI) concentrations found do not appear to pose a significant human health threat. No off-site soil COI were identified that required assessment.

Based on the noted exceedances of the Tier II Residential Cleanup Goals at property boundaries and/or at off-site locations, it is apparent that potentially unacceptable risks are posed by potential direct contact (i.e., ingestion) groundwater exposures to off-site residents in the immediate vicinity of the subject site. However, an evaluation of volatilized vapor from groundwater to indoor air using data from an off-site well posed no significant human health threat for offsite residents. No on-site groundwater COI were identified that required assessment.

The surface water non-carcinogenic risks were below the EPA's target hazard index of 1.0. Cis-1,2-dichloroethene, the only surface water COI, does not have carcinogenic toxicity constants. Therefore, no surface water carcinogenic risk levels were estimated. Off-site surface water COI concentrations found do not appear to pose a significant human health threat.

There are two major sources of organic constituents at the Plant 10 site: the principal source area is located near the northwestern corner of the property , and a secondary source area is located near the southeastern corner of the property . The direction of groundwater flow is generally toward the southeast in the western portion, and toward the south in the southeast portion of the site. As a result, the point of regulatory compliance is the southern and southeastern boundaries of the site. These property boundaries abut the City of Indianapolis Property and residential areas, respectively.

Remediation cleanup goals were determined for groundwater and soil in two phases. The objective of the first phase was to determine the maximum concentration of contaminants of interest (COI) that could be left in groundwater and not exceed Federal maximum contaminant levels (MCLs) for drinking water at the compliance point. The second phase determined the maximum concentration of COIs that could be left in the soil and, due to leaching, not exceed the groundwater cleanup goals established in the first phase.

The groundwater cleanup goals for the southeastern area were set at MCLs since little attenuation is expected to occur in the aquifer between the source area and the compliance point. The groundwater

cleanup goals are 5 ug/L for trichloroethylene (TCE), 70 ug/L for cis-1,2-dichloroethene (cis-1,2-DCE), and 2 ug/L for vinyl chloride (VC). In the western area, some attenuation between the source and the compliance point will occur. As a result, groundwater cleanup goals are based on the results of analytical modeling with 15 ug/L for TCE, 170 ug/L for cis-1,2-DCE, and 5 ug/L for VC.

Soil cleanup goals were determined using the SESOIL analytical model. Based on the calculated groundwater cleanup goals, the model was used to determine applicable soil cleanup goals. Based on the results of the modeling and consideration of direct-contact exposures, the soil cleanup goals in the southeastern area are 24,182 ug/kg TCE, 181,425 ug/kg cis-1,2-DCE, and 300 ug/kg VC. In the western area, the goals are 43,528 ug/kg TCE, 259,605 ug/kg cis-1,2-DCE, and 300 ug/kg VC.

Remediation alternatives considered for this site fall under two areas of classification. The first is non-treatment of impacted soil and groundwater and the second is combined soil and groundwater treatment. Based on time to cleanup and potential institutional controls, the non-treatment options were not considered applicable. In addition, a monitor-only approach would not reduce the mobility, destroy, or reduce the volume of contaminants.

Of all the alternatives for remediation, the two which are most technically feasible are air sparge and soil venting (AS/SV) and soil venting with groundwater extraction .

Based on preliminary engineering calculations, the cost for capital purchases, installation, and operation and maintenance (O&M) for one year of the AS/SV system could range from $410,000 to $460,000. Annual O&M of the system could range from $65,000 to $95,000. These estimates do not account for the possibility of off-gas treatment of vapors. The cost for capital purchases, installation, and operation and maintenance (O&M) for one year of the groundwater extraction/SV system could range from $400,000 to $510,000. Annual O&M of the system could range from $90,000 to $110,000.

A SV/AS pilot test was conducted at the site on February 24, 1997. The test results suggest that this technology is feasible given the site conditions.

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1.0 INTRODUCTION

Fluor Daniel GTI, Inc.(Fluor Daniel GTI) has completed the following Feasibility Study (FS) for the Allison Engine Company, Plant 10 in Indianapolis, Indiana. A site location map is shown on **Figure 1**. This scope of work has been completed, when considered as a whole, to be consistant with the National Contingency Plan as referenced in 40 CFR 300.700 (Subpart H-Participation by Other Persons). The primary objective of the FS was to develop and evaluate appropriate remedial alternatives for contaminants of interest (COI) identified in the Remedial Investigation.

1.1 Background Information

1.1.1 Site Description

The subject property is the site of the former General Motors Corporation Allison Gas Turbine Division (AGT) Plant 10. This plant was purchased by General Motors from BHT Corporation (BHT) for use as a warehouse for obsolete machines, tooling, and fixtures in 1973. Prior to 1973, the facility was operated as a carburetor remanufacturing and brake overhaul facility by BHT. The original building was constructed in 1956 and renovated in 1970, doubling the floor space. The facility was used as a warehouse by General Motors until the mid 1980s at which time it became part of the AGT Division and continued to be managed as a warehouse. The property was then sold to The Allison Engine Company in December 1993 as part of the sale of AGT.

The site is occupied by a single warehouse. The area surrounding the warehouse is covered by asphalt and concrete. The western and southern sections of the property are grass with wooded areas. A site map showing salient site features is presented as **Figure 2.**

The property is zoned industrial and is currently occupied by Genuine Parts Company for use as a warehouse and distribution center. Land use in the surrounding area of the site is mixed use with zoning predominantly residential, general business, and industrial. The property is bordered by a wooded area, Little Eagle Creek, and Michigan Meadows Apartments to the south, a residential neighborhood to the east, a city park (Olin Park) to the north, and Holt Road and an Allison Transmission Plant to the west. Features of the surrounding area are presented on the Vicinity Map **(Figure 3)**.

The site is located on the southwest side of Indianapolis, Indiana on the Tipton Till Plain. The surface topography over most of the site is relatively flat. The southern third of the site slopes moderately to the south, towards Little Eagle Creek. Surface elevations at the site range from approximately 715 feet to 705 feet near Little Eagle Creek to the south. The subsurface of the site area is characterized by two thick layers of sand separated by a layer of silty clay. Another discontinuous layer of silty clay is found at the surface. The lower sand unit was not encountered at the maximum depth of penetration (65 feet) in the western area. Based on a comparison to published data, the two sand units are assumed to be the middle and lower confined aquifers of Meyer et al.,1975. The intermediary silty clay unit ranges in thickness from

approximately 8 feet to greater than 33 feet. According to Meyer et al. (1975), this clay layer acts as a semipervious confining bed (aquitard).

Based on data collected during three gauging events in 1995 and 1997, groundwater occurs at elevations ranging from 698.92 to 703.75 feet in the shallow water bearing unit, 698.83 to 701.00 feet in the lower sand unit, and 689.10 to 700.68 feet in the intermediary clay unit. Groundwater elevation data indicates groundwater flows generally towards the south (Little Eagle Creek). A comparison of groundwater elevations in the three well clusters (MW-153, MW-202, and MW-302; MW-150 and MW-200; and MW-151, MW-201, and MW-301) indicated a downward vertical hydraulic gradient in the western portion of the site and east of the plant. An upward hydraulic gradient was observed offsite to the southeast. Rising head permeability tests indicated average hydraulic conductivities of 137 feet per day in the shallow sand unit, 8.7 feet per day in the lower sand unit, and 0.012 feet per day in the intermediary clay. Based on the low hydraulic conductivity of the intermediary unit, it appears to act as an aquitard between the aquifers.

Fluor Daniel GTI obtained all available drilling logs of domestic water wells on record at the Indiana Department of Natural Resources, Division of Water. A total of 160 domestic wells were identified as being located within a one-mile radius of the subject site, the nearest of which lies approximately 1,000 feet north (upgradient) of the property. The wells are completed within limestone bedrock, clay, or sand and gravel units at depths ranging from 30 to 270 feet below grade (bg). Records indicate the Allison Transmission Plant across Holt Road to the west has two water supply wells, the nearest of which lies approximately 1,600 feet northwest of the site (cross-gradient). The majority of the water supply wells identified are located to the north, west, and south of the site. A total of 47 municipal or high capacity wells were identified as being located within a two mile radius of the subject site, with 17 of those located within a one mile radius. The nearest of these wells lies approximately 1,400 feet northwest of the site along Little Eagle Creek (cross-gradient). A house-to-house survey of local residences along the east side of Olin and the west side of Luett Avenues was conducted by the Marion County Health Department (MCHD) in December, 1996. A single domestic well was located at 709 North Olin Avenue. The construction of the well is unknown. This well was not identified during the well search conducted at the Department of Natural Resources. Only well logs completed by the drillers and submitted to IDNR are found in the IDNR's files. The approximate location of this domestic well is provided on **Figure 3**. The well was sampled by MCHD on January 2, 1997. The analytical results indicate that volatile organics are not present in this water supply.

Potable water is supplied to the area by the Indianapolis Water Company (IWC). The water supply is drawn from numerous wells in the area, the majority of which are located along Eagle Creek approximately 1.5 miles west (upstream) of the subject site. A discussion with the Supervisor of Customer Contact at IWC indicated that residences across Olin Avenue to the east and the Michigan Meadows Apartment complex across Little Eagle Creek to the south are supplied by IWC.

The nearest body of surface water is Little Eagle Creek located adjacent to the southern property boundary. This creek flows towards the east-southeast and eventually joins to Eagle Creek approximately one mile to the south of the site.

Indianapolis has a temperate climate with warm summers and no dry season. Precipitation is distributed fairly evenly through out the year. The average precipitation is 39.99 inches per year and the average annual temperature is 52.5° Fahrenheit (F). (NOAA, 1989). Over a 29 year period from 1960 to 1989 the average monthly rainfall ranged from a low of 2.69 inches in October to a high of 4.03 inches in June. Average temperature for the same period ranged from a low of 28.0° F in January to a high of 75.8 ° F in July. Spring and early summer rains usually exceed winter precipitation. (Sturm and Gilbert, 1978).

1.1.2 Site History

Two environmental investigations were completed at this property by Engineering Science, Inc. (ESI) in 1992. The initial investigation, entitled *Phase I Information Review Report for General Motors Corporation Allison Gas Turbine Division*, was completed by ESI in July of 1992. This assessment involved no intrusive exploration of environmental conditions. The Phase I assessment identified the following potential areas of environmental concern:

- two reported releases (100 gallons of quench oil in the southwest corner of the property and an unknown amount of hydraulic fluid in the southwest courtyard);
- possible waste burial area at western end of property; and
- possible area of dumping near the northwest corner of the plant.

The above ground storage tanks were reported to be in good condition. The Phase I identified the Plant 10 site as a potential area of concern (PAOC). The report included a recommendation to install three monitoring wells and one soil boring.

An intrusive follow-up assessment of the areas of environmental concern identified during the Phase I assessment was completed by ESI in November of 1993. Methods and results of this additional investigation were reported in a document titled *Phase II Site Assessment Final Report for General Motors Corporation Allison Gas Turbine Division* dated November 19, 1993. During the initial phase of work, three monitoring wells (MW-132, MW-133, and MW-135) were installed and one soil boring (SB-134) was advanced at the site. A soil gas survey was completed on the west side of the property during this investigation. During the second phase of this investigation four monitoring wells (MW-145 through MW-148) were installed and two soil borings (SB-149 and SB-150) were advanced on-site.

Results of this investigation identified trichloroethene (TCE), vinyl chloride (VC), 1,2-dichloroethene (1,2-DCE), tetrachloroethene (PCE), toluene, and methylene chloride in the soil on-site. Compounds most

frequently detected included TCE, 1,2-DCE, and VC. The west side of the site was confirmed as a PAOC during the Phase II investigation, however the source was unknown.

O'Brien and Gere Engineers, Inc. (OGE) conducted a Buyer Environmental Assessment for Plant 10 in May, 1994. They advanced six soil borings (SB-10-1 through SB-10-5 and OBG-10-1) and installed one monitoring well MW-10-1 in soil boring OBG-10-1. Surface samples collected included two surface soil samples near an area containing brake pad pieces, two brake pad samples for asbestos testing, two sludge samples from the sumps located south of the building. These sumps have since been removed. A total of six subsurface soil samples and three groundwater samples were also collected.

Fluor Daniel GTI conducted a Remedial Investigation at this site during the period of July 1995 to February 1997. Activities completed during the investigation included the advancement of fourteen soil borings, one Hydropunch, and six Geoprobe borings; collection of soil samples for laboratory analysis; the installation of nine shallow and five deep monitoring wells in the fourteen borings; surveying of all new wells; groundwater elevation monitoring and sampling of all wells on-site; stream survey and sampling of Little Eagle Creek; and rising head permeability tests from the newly installed wells. Results of the investigation were used to better characterize the geology and hydrogeology of the site, to further delineate VOCs and metals occurrence, and to assess the potential risk of VOCs and metals occurrence to human health and the environment.

1.1.3 Nature, Extent and Magnitude of Contamination

Analytical results for soil samples collected from the vadose zone during the above mentioned site investigations indicated the presence of VOCs in 17 of the 23 samples collected. TCE and 1,2-DCE were the most frequently detected compounds. Concentrations of TCE ranged from 29 micrograms per kilogram (ug/kg) to 120,000 ug/kg. 1,2-DCE concentrations ranged from 4 ug/kg to 12,000 ug/kg. Levels of adsorbed VC ranged from 12 ug/kg to 500 ug/kg. TCE was detected on site at one location (MW-132) above the Indiana Department of Environmental Management (IDEM) Tier II Non-Residential Cleanup Goal of 25,730 ug/kg. VC was detected at one location above its Tier II Non-Residential Cleanup Goal of 130 ug/kg. Using the Tier II Non-Residential Cleanup Goals as delineation, VOC occurrence in soil has been defined.

Using TCE as an indicator, multiple source areas (i.e., areas of elevated VOC concentrations) appear to be present in the western portion of the site (e.g., MW-132, GP-2, and MW-133). A soil sample collected from the air-water interface southeast of the plant building (MW10-1) contained 3,800 ug/kg TCE. This value was within the same order of magnitude as two groundwater samples collected from this location, therefore, it is not clear whether a source is present in this area. Levels of TCE an order of magnitude lower were measured in samples collected from the vadose zone on the southeast side of the plant building (MW-152) and further to the south (GP-5). These may represent other small source areas.

One sample collected southeast of the property contained a TCE concentration above the Tier II Residential Cleanup Goal. The sample, collected from a depth of 18-20 feet contained 170 ug/kg TCE which is above the Tier II Residential Cleanup Goal of 80 ug/kg. This sample was however, collected from below the water table. The groundwater sample collected from this location contained 280 ug/l TCE and therefore the soil results may reflect the presence of TCE in the groundwater.

A total of 28 of the 41 groundwater samples collected from monitoring wells during the period of July 1995 to February 1997 contained detectable concentrations of VOCs. Samples from seven of the wells were below detection limits for all analyzed constituents. As was the case with soil, the most frequently detected compounds were TCE and 1,2-DCE. Analytical data indicate detectable TCE concentrations ranged from 5.4 ug/L to 13,000 ug/L, cis-1,2-DCE concentrations ranged from 5.3 ug/L to 65,000 ug/L, trans-1,2-DCE concentrations ranged from 5.9 ug/L to 1,400 ug/L, and detectable VC concentrations ranged from 12 ug/L to 3,400 ug/L. Wells located west, southwest, and southeast of the building and/or property contained TCE, 1,2-DCE, and/or VC concentrations above the Tier II Non-Residential Cleanup goals. Based on this data, VOCs occurrence in groundwater has not been delineated horizontally south and east of MW-157. However, two additional wells are planned for this area. VOCs occurrence in groundwater south of HP-1 near Little Eagle Creek also has not been delineated. Shallow groundwater likely discharges into Little Eagle Creek, and therefore, it is unlikely that dissolved VOCs occurrence extends south of the creek.

Based on isoconcentration maps constructed for TCE, 1,2-DCE, and VC in groundwater, at least two potential source areas of elevated concentrations were identified. These areas are west of the building in the vicinity of MW-132 and southeast of the building in the vicinity of MW10-1. Based on a higher concentration of TCE degradation products (1,2-DCE and VC), it would appear that the potential source area due west of the building is older than the other area. Non-determined aliphatic hydrocarbons were detected in samples collected from MW-157 offsite to the southeast. The occurrence of these compounds appears to be localized in the vicinity of the well.

Groundwater data collected during previous investigations were compared to recent data (July 1995 to February 1997) to evaluate trends in dissolved VOCs concentrations. In general, most of the wells did not exhibit major changes in dissolved VOCs concentrations with time. Dissolved VOCs concentrations did increase in wells MW-132 and MW155. Detected concentrations decreased in wells MW-148, MW-153, and MW-156. Wells MW-132 and MW155 are located in the western potential source area. Well MW-148 is located downgradient of MW-132. MW-153 is located in the well cluster located southwest of the building and MW-156 is located offsite to the southeast.

The discharge (stream flow volume) of Little Eagle Creek was measured on October 4, 1996 and February 10, 1997. Maximum stream flows of 8 cubic feet per second (cfs) and 23.77 cfs were measured for these dates, respectively. Data collected from a gauging station 1.2 miles upstream indicated historical average flows of 11.1 cfs and 30.54 cfs, respectively, for the same two months. This suggests that the gauging station data could be used to describe relative stream flow trends.

Loading of VOCs to Little Eagle Creek was estimated using concentrations in groundwater at HP-1 and the above stream flow data. A concentration of 25 ug/L 1,2-DCE was predicted to be detected in Little Eagle Creek using the October, 1996 flow data. The actual concentration measured in Little Eagle Creek near HP-1 in October, 1996 was 17 ug/L. The predictive model and laboratory analytical results both indicated that detectable TCE and VC concentrations were not present in Little Eagle Creek in October 1996 and February 1997. Both also indicated that detected 1,2-DCE concentrations were not present in February 1997.

1.1.4 Baseline Risk Assessment

Site-specific human health risks were calculated for the site using IDEM and Environmental Protection Agency (EPA) risk assessment methodology. No soil carcinogenic risks for non-residential exposures to soils exceeded the $1x\ 10^{-5}$ target risk level. Assessed non-residential scenarios included the on-site worker and on-site construction worker exposure to surface and subsurface soil. The only on-site soil contaminant of interest (COI), vinyl chloride, does not have non-carcinogenic toxicity constants. Therefore, no soil non-carcinogenic hazard indices for non-residential exposures were estimated. On-site soil COI concentrations found do not appear to pose a significant human health threat. No off-site soil COI were identified that required assessment.

Based on the noted exceedances of the Tier II Residential Cleanup Goals at property boundaries and/or at off-site locations, it is apparent that potentially unacceptable risks are posed by potential direct contact (i.e., ingestion) groundwater exposures to off-site residents in the immediate vicinity of the subject site. However, an evaluation of volatilized vapor from groundwater to indoor air using data from an off-site well (MW-157) posed no significant human health threat for offsite residents. No on-site groundwater COI were identified that required assessment.

The surface water non-carcinogenic risks were below the EPA's target hazard index of 1.0. Cis-1,2-dichloroethene, the only surface water COI, does not have carcinogenic toxicity constants. Therefore, no surface water carcinogenic risk levels were estimated. Off-site surface water COI concentrations found do not appear to pose a significant human health threat.

1.1.5 Preliminary Identification of ARARs

For each hazardous waste site governed by CERCLA and SARA, congress has directed EPA to consider the degree of public health or environmental protection afforded by each remedial alternative considered. Section 121(d) of SARA requires that remedial actions be consistent with and in accordance with other environmental laws. These laws may include: the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Toxic Substances Control Act (TSCA), and the Safe Drinking Water Act (SDWA), among other federal laws, and any state law that has stricter requirements than the corresponding federal law.

These regulations and standards preliminarily identified for the **GM-Allison Plant 10** site have been categorized as "applicable or relevant and appropriate requirements" (ARARs), or as "to be considered" (TBCs). ARARs are legally binding. While TBCs are not legally binding, they will be considered along with ARARs as part of the site endangerment assessment and may be used in determining the necessary level of cleanup for protection of health or the environment.

ARARs may be further categorized as: chemical-specific requirements that may define acceptable exposure levels and therefore be used in establishing preliminary remediation goals; location-specific requirements that may set restrictions on activities within specific locations such as floodplains or wetlands; or action-specific requirements that may set controls or restrictions for particular treatment and disposal activities related to the management of hazardous wastes.

Based on these definitions, lists of ARARs and TBCs potentially applicable to the **GM Allison Plant 10** site have been identified and are shown in **Table 1** . This preliminary identification of ARARs and TBCs was used in identifying potential remedial alternatives to be developed and evaluated in the FS. Because the FS is iterative in nature, both state and federal ARAR identification may continue throughout the FS process as additional information concerning remedial action alternatives is acquired. This alternatives array document is intended to solicit any additional ARARs from appropriate state and federal agencies.

2.0 Remediation Cleanup Goals

There are two assumed source areas of COIs at the site; the principal area is located in the western portion of the property and a secondary source area is located in the southeastern corner of the property. Since groundwater flows toward the southeast and the south in the western and southeastern portions of the site, respectively, the most conservative point of regulatory compliance is the southern boundary of the site. The site abuts with the City of Indianapolis property along this southern boundary.

Remediation cleanup goals were determined for groundwater and soil in two phases. The objective of the first phase was to determine the maximum concentration of COIs that could be left in groundwater and not exceed MCLs at the compliance point. The objective of the second phase of modeling was to determine the maximum concentration of COIs that could be left in the soil and, due to leaching, not exceed the groundwater cleanup goals established in the first phase.

2.1 Groundwater Cleanup Goals

2.1.1 Southeastern Area

The southeastern source area, in the vicinity of MW10-1, is located less than 50 feet upgradient of the selected compliance point (the southern property border at the fence line). Little attenuation is expected between the source and the compliance point; therefore, the cleanup goals in this area are set at MCLs. Consequently, groundwater remediation cleanup goals for the southeast source area are 5 ug/L for TCE, 70 ug/L for cis-1,2-DCE, and 2 ug/L for VC.

2.1.2 Western Area

The source area in the western portion of the site is assumed to be represented by MW-132. The nearest compliance point can be conservatively set at the property line located about 180 feet directly south of MW-132, near MW-153. Although not directly downgradient, this location represents the most conservative compliance point for the western area of the site. An alternate compliance point may be set at the creek centerline located about 490 feet directly downgradient of MW-132. The following analysis determined groundwater cleanup goals for each COI at each compliance point using the following methods: (1) a simplified two dimensional (2-D) analytical equation and (2) a three dimensional (3-D) analytical model (AT123D).

The 2-D method used the 1995 chemical data from MW-132 and MW-153. Since this method is sensitive to large variations in concentrations the more rigorous AT123D modeling was completed to better deal with the observed variability in chemical data (as suggested by the most recent 1997 results). As shown in the next two sections, both methods do yield similar results when considering chemical data through 1995. However, if the latest 1997 data is used, the simplified 2-D analytical equation would yield a different cleanup goal. Consequently, the results of the 3-D analysis are used to calculate site cleanup goals.

2.1.2.1 Simplified 2-D Analytical Equation

If volatilization to the vadose zone and biodegradation are neglected, the principal mechanism for the attenuation of COI concentrations in groundwater is hydrodynamic dispersion. The equation describing COI dispersion from a point source located at the origin in a two-dimensional aquifer subject to uniform flow is (Bear 1979, eq. 7-156):

$$dC(x,y,t) = \frac{dM}{2\pi[2D_L^{'}t]^{1/2}[2D_T^{'}t]^{1/2}} exp\left[-\frac{(x - v't)^2}{4D_L^{'}t} - \frac{y^2}{4D_T^{'}t}\right] \quad (1)$$

Where

dM	=	C_o Q dt (mass of instantaneous slug of tracer)
v'	=	v/R
D_L'	=	D_L/R
D_T'	=	D_T/R
Co	=	input COI concentration
C	=	downgradient COI concentration
D_L	=	coefficient of longitudinal dispersivity
D_T	=	coefficient of transverse dispersivity
M	=	COI mass
Q	=	input COI flow
R	=	retardation coefficient
t	=	time
v	=	velocity of groundwater flow
x	=	longitudinal (i.e., along the direction of flow) coordinate
y	=	transverse coordinate

Convolution and integration of this equation can be used to obtain analytical expressions for the downgradient COI concentration that spreads from a given source area and input concentrations. Analytical codes such as AT123D (Yeh, 1981), provide solutions for the dispersion/retardation problem. It is important to note that the general dispersion equation, and particular solutions such as above, are linear with respect to the associated COI concentrations. Therefore, if the input concentration is halved and all other input parameters are fixed, all the calculated downgradient concentrations also will be halved.

In addition to the theoretical framework presented above, steady-state COI distributions were hypothesized in the development of the cleanup objectives for the groundwater at the site. The facility has apparently been operated only as a warehouse since 1973. Therefore, it can be assumed that on-site operations involving the use of chlorinated solvents have ceased for 20 or more years. A rough calculation of COI migration in the western area based on the approximate distance from well MW-132 to the point of compliance (set at MW-153) indicates the three COIs have most likely reached a steady-state condition at MW-153 in a time frame of less than 20 years. Additionally, comparisons of groundwater data collected from 1992 to 1995 reveal generally consistent concentrations of the groundwater COI. These two lines of

evidence support the hypothesis that the COI plumes have likely reached steady-state conditions from well MW-132 to MW-153.

Given that the downgradient analytical data for well MW-153 is available and that the concentration distributions have likely reached steady-state conditions, the cleanup criteria using the linear relationship between source area COI concentrations and point-of-compliance COI concentrations can be expressed as:

$$C_{goal} = (C_{point\ of\ compliance})\ (C_{MW132}/C_{MW153}) \qquad (2)$$

where:

$C_{point\ of\ compliance}$ is represented by the MCL for each COI.

Using equation (2) and the analytical results from 1995, the calculated concentration cleanup goals for the western area are:

C = 5(1,700/570) = 15 ug/L for TCE,
C = 70(5,115/980) = 365 ug/L for 1,2-DCE, and
C = 2(600/22) = 55 ug/L for VC.

Note that 1,2-DCE and VC are degradation products of TCE and more volatile than TCE. TCE has a half-life of one year in soil and 4.5 years in groundwater, however half-life in groundwater may be reduced to one year in the presence of aerobic bacteria (Howard, et al., 1991). Therefore, the treatment of TCE to a cleanup goal of 15 ug/L will result in depletion of the biodegradation parent product (TCE) and in the enhanced volatilization of 1,2-DCE and VC. Because of these two factors and because the cleanup goal for TCE is more stringent than that for 1,2-DCE or VC, the actual final concentrations of 1,2-DCE and VC are expected to be significantly lower than the cleanup goals presented above, when the cleanup goal for TCE is achieved.

2.1.2.2 3-D Analytical Model (AT123D)

The analytical groundwater flow and solute transport model AT123D was used as a second, more rigorous, method to determine groundwater cleanup goals in the western area. The simplifying assumptions associated with this groundwater flow model requires the aquifer to be treated as homogenous and isotropic with infinite or user-defined limits on areal extent. Groundwater flow is assumed to be uniform and at steady-state conditions. These assumptions were reasonably satisfied by available site hydrogeologic information. The following model input parameters, taken from qualified field data wherever possible, were used for the base-case model.

AT123D Model Input Values			
Aquifer Properties			
	Value	Units	Reference
thickness	18	feet	well logs
soil bulk density	1.76	g/cm^3	lab results
effective porosity	25	percent	assumed, Dominico and Schwartz, 1990.
hydraulic conductivity	137	ft/d	slug tests
hydraulic gradient	0.0045	ft/ft	water level data
plume travel distance	460	ft	chemical data
longitudinal dispersivity	46	ft	10% of travel distance (Gelhar et al., 1992)
transverse dispersivity	4.6	ft	1% of travel distance (Gelhar et al., 1992)
vertical dispersivity	0.16	ft	0.035% of travel distance (Gelhar et al., 1992)
total organic carbon	0.0012	mg/kg	lab results

Chemical Properties					
	TCE	cis-1,2-DCE	VC	Units	Reference
distribution coefficient	1.5E-4	5.9E-5	5.9E-5	m^3/kg	USEPA, 1990
biodegradation half-life	4.5	7.9	7.9	years	Howard et al., 1991
source loading rate	1E-4	1E-4	1E-4	kg/hr	estimated using site data

The calibration of the model presented a number of challenges. First, the data used to calibrate the model was obtained from wells completed either in the upper or lower portion of a relatively thin aquifer. However, data from these wells indicate a vertical concentration gradient exists. Second, for calibration, the available chemical record is limited as it contains wells that were sampled only two to four times in the period from 1992 to 1997. Finally, the recent variability in concentrations is relatively large in MW-132 and MW-153. Based on these observations, model calibration targets were established as follows: (1) the chemical record from 1992 to 1995 was used, (2) wells were designated "shallow" or "deep" if completed in the upper or lower half of the aquifer, respectively, and (3) modeled concentrations should be within the observed variability of data from 1992 to 1995 or within the same order-of-magnitude.

TCE was used to calibrate the model using the above base case values. This provided a starting point from which source area loading and dispersivity values were adjusted until a reasonable match between predicted and observed TCE groundwater concentrations was achieved. The time of release is not known but was assumed to be 1973 and, therefore, the calibration period is from 1973 to 1993.

To achieve an acceptable match between predicted and observed TCE concentrations, the source loading was increased from the initial estimate of 1.4E-4 kg/hr to 2.5E-4 kg/hr and the values for transverse and vertical dispersivity were subsequently reduced from 4.6 to 3.3 feet and from 0.16 to 0.033 feet, respectively. The following is a summary of the calibration results for TCE in ug/L using the chemical data record from 1992 to 1995.

Location	TCE Concentrations (ug/L)					Comments
	Observed				Predicted	
	1992	1993	1995	1997	1993	
MW-132	280	1900	1700	15000	790	Source Area - Shallow
MW-147	-	39	<5	51	5	Source Area - Deep
MW-133	47	24	23	53	93	Shallow
MW-145	-	9	5.6	43	20	Deep
MW-153	-	-	570	5.4	150	Shallow

To check the calibration, the calibrated model was used to simulate cis-1,2-DCE from 1973 to 1993. The only parameter that can be adjusted is the source area loading rate, once chemical-specific properties are changed. The results are shown in the table below.

Location	cis-1,2-DCE Concentrations (ug/L)					Comments
	Observed				Predicted	
	1992	1993	1995	1997	1993	
MW-132	1500	2400	5100	65000	5200	Source Area - Shallow
MW-147	-	<140	<5	95	61	Source Area - Deep
MW-133	81	56,	70	100	862	Shallow
MW-145	-	440	530	<5	135	Deep
MW-153	-	-	980	<5	1220	Shallow

Based on the calibration results, the model is deemed capable of being used as a tool to determine groundwater cleanup goals for TCE, cis-1,2-DCE, and VC. Using the calibrated model, source loading rates were adjusted for each chemical until concentrations at the compliance points were at or below their respective MCL. The on-site cleanup levels for the conservative compliance point at the property line are 9 ug/L for TCE, 100 ug/L for cis-1,2-DCE, and 3 ug/L for VC. For the other possible compliance point at the stream, the cleanup goals are 15 ug/L for TCE, 170 ug/L for cis-1,2-DCE, and 5 ug/L for VC.

2.2 Soil Cleanup Goals

The objective of the second phase of modeling was to determine the maximum concentration of COIs that could be left in the soil without leaching to groundwater and exceeding the groundwater cleanup goals established in the phase one analysis. The 1-D analytical vadose zone model SESOIL (GSC, 1996) was used with a climatic database for Indianapolis to predict groundwater concentrations due to leaching of COIs from the vadose zone. Infiltration is the driving force for downward migration of COIs from the vadose zone.

The simplifying assumptions associated with SESOIL requires the soil to be treated as homogenous and isotropic with user-defined limits on source areal extent. These assumptions were reasonably satisfied by available site hydrogeologic information. The following model input parameters, taken from qualified field data wherever possible, were used in the model.

SESOIL Model Input Values					
Soil Properties					
	Value	Units	Source		
thickness	10	feet	well logs		
soil bulk density	1.76	g/cm^3	lab results		
effective porosity	25	percent	assumed, Dominico and Schwartz, 1990.		
total organic carbon	0.0012	mg/kg	lab results		
intrinsic permeability	1.0E-8	cm^2	assumed, GSC, 1996		
Chemical Properties					
	TCE	cis-1,2-DCE	VC	Units	Reference
molecular weight	131.50	96.94	62.5	g/mol	GSC, 1996
solubility	1100	3500	2670	mg/L	GSC, 1996
Henry's Constant	0.0103	0.00674	0.00674	m^3-atm/mol	GSC, 1996
K_{oc}	126	49	57	-	GSC, 1996
diffusion coefficient in air	0.083	0.091	0.091	cm^2	GSC, 1996 GSC, 1996

In the model, the source was assumed to occupy the upper five feet of the vadose zone. The initial soil concentration for each COI was loaded into this zone during the first model time step. As a staring point, the IDEM Tier II Non-residential Cleanup Goals were used. The simulation period was ten years with the greatest leachate concentration, typically occurring within the first five years, applied to the groundwater. The Summer's Method (GSC, 1996) was used to estimate the groundwater concentration due to leaching

from the vadose zone. The leachate was assumed to enter at the water table over a 30-square foot area and mix completely with clean groundwater in the upper half (9 feet) of the aquifer.

The resulting groundwater concentration due to leaching was compared to the groundwater cleanup goals determined using the AT123D model. The maximum soil concentration for each COI that leached to produce a groundwater concentration equal to the groundwater cleanup goal was determined. The modeling results are presented below.

Site Specific Soil Cleanup Goals (ug/Kg)			
Southeastern Area			
	TCE	cis-1,2-DCE	VC
	24,182	181,425	4,417
Western Area			
	TCE	cis-1,2-DCE	VC
Property Line Compliance Point	43,528	259,179	6,625
Little Eagle Creek Compliance Point	75,547	440,605	10,042

IDEM Tier II Nonresidential cleanup goals for subsurface soil are based on (1) direct-contact exposure scenarios using standard human health risk assessment calculations and (2) protection of groundwater (IDEM, 1996). The site specific subsurface soil cleanup goals presented in the above table were based on protection of groundwater. These cleanup goals were compared to the Tier II goals for direct-contact. The calculated site specific closure goals are below the Tier II goals for direct-contact exposure scenarios for TCE and cis-1,2-DCE. However, the site specific goal for VC is above the Tier II value; therefore, to be protective of human health, the Tier II value of 300 ug/kg for VC in subsurface soils (IDEM, 1996) is used.

3.0 DEVELOPMENT AND SCREENING OF TECHNOLOGIES

3.1 Introduction

The objective of the development and screening of technologies is to identify, screen, and develop alternatives for removal, containment, treatment and/or other remediation of impacted areas at the site. The initial development and screening of alternatives is based on information provided in the Remedial Investigation Report.

COIs, impacted media, extent and magnitude of occurrence, and cleanup goals are discussed in Section 1.0. In summary, the COIs are TCE, 1,2 DCE, and VC. Two general areas of concern requiring remedial evaluation were identified, one southeast of the warehouse building near MW10-1 and a second comprising the western portion of the site south of MW-132. Remedial alternatives need to be considered for COI occurrence in groundwater in the shallow unconfined aquifer in both areas of concern. Alternatives for the remediation of COI in soil only need to be considered for the western area of concern. Initial screening for remedial technologies was accomplished by using matrices for evaluating remediation strategies (**Tables 2 and 3**). These matrices are based on applicability (technical feasibility), protection of public health and the environment, cost and treatment time, and administrative considerations. The development and screening criteria are discussed in more detail below.

3.1.1 Overview of Development and Screening Process and Criteria

In order to screen remediation technologies and identify potential corrective measure alternatives, the following site specific information is considered:

- chemical type and characteristics;
- site medium;
- chemical concentrations distribution throughout medium;
- cleanup goals;
- technical feasibility of attaining cleanup goals;
- time frame for remediation and;
- costs to accomplish the remedial objective.

3.1.1.1 Applicability

The applicability of a technology to remediate impacted areas at any specific site is evaluated with regard to the specific advantages and disadvantages listed below.

Advantages

- Mobility reduction: when the technology significantly reduces the potential for migration.

- Destruction: when the technology destroys, degrades or otherwise transforms the chemical to a non-toxic form.
- Volume reduction: when the technology significantly reduces the amount of contamination in the impacted areas.
- Performance and reliability: whether the technology has a proven track record for treating the chemicals in a similar site setting.
- Implement ability: when the logistics of designing, procurement, installing, and operating the technology at the given site appear to be direct.

Disadvantages

- Emerging technology: when a technology is not fully developed and may not be reliable.
- Inappropriate technology: when site conditions are not technically suitable for the application of the technology.
- Not permittable: if permitting of the technology at the site is very difficult or impossible to obtain.
- Additional treatment required: if the technology requires additional equipment or processes to handle secondary controls (e.g., off-gas treatment)
- Operating area: application of the technology would require a large area of the site surface.
- Inappropriate soil material: if the soil structure is incompatible with the treatment process.
- Depth to water: whether depth to groundwater is inappropriate for the treatment alternative.
- Potential additional liability: whether the treatment technology may add additional liability.

The advantages and disadvantages are used to give each alternative a numeric applicability rating. This rating gives a numerical value to the relative applicability of the technology to the specific site with regard to technical merits and the ability to permit the process. This is a subjective rating based upon the listed advantages and disadvantages of the technology applicability as well as any additional professional judgements. The rating scale is from zero to five, with zero equal to "not applicable, available, or implementable" to five for "widely used, proven and applicable."

3.1.1.2 Protection of Public Health and the Environment

Any remediation technology under consideration should maintain exposure to site workers, visitors, and surrounding population to a minimum. The treatment technology is considered an advantage when the technology reduces human exposure to the chemicals or minimizes the exposure through the process of remediation. This is a numerical score ranging from zero to three based on the use of the technology. Community impact is also important and the technology is considered a disadvantage if the application of the technology could be perceived as negatively impacting the local community or environment.

3.1.1.3 Costs and Treatment Time

This rating gives a numerical value to the relative capital and operating costs incurred in implementing the technology.

- Capital Costs: relative cost of obtaining and installing the technology.
- Operating Costs: relative costs of operating and maintaining the treatment system.

The treatment time rating gives a numerical value to the potential of the treatment technology to perform the desired site remediation within an acceptable time.

3.1.1.4 Administrative Considerations

These considerations include the time necessary for administrative project oversight and control from initial conception through cleanup. This rating gives a numerical value to the relative administrative oversight required by the technology. Ratings are from one to three with three requiring the least amount of administrative oversight. This includes required engineering design work and oversite.

3.1.1.5 Rating Score

The rating score is defined as the arithmetic scoring of each of these criteria based on the following calculation:

$$\text{Rating Summation} = AP \times HE \times AC \times (C + T)$$

Where	AP	=	Applicability
	HE	=	Health and the Environment
	AC	=	Administrative Considerations
	C	=	Costs
	T	=	Treatment Time

For each technology, these criteria are given a score that ranges from one up to three or five, depending on the criteria. Table 2 provides a detailed summary of the scoring used within each criteria.

3.2 Development of Alternatives

Remediation alternatives considered for this site fall under two areas of classification. The first is non-treatment of impacted soil and groundwater and the second is active soil and groundwater treatment. Each of these categories is broken into subsections with alternative technologies relevant to that process. The alternatives are presented in matrix form with scoring as presented on **Tables 2 and 3**. The alternatives initially scored and presented are under general consideration and may be applicable to this site. The alternatives are broken down as follows:

3.2.1 Non-Treatment of Impacted Soil and Groundwater

Listed below are options that provide a baseline by which to compare other alternatives. Alternatives are as follows:

NO ACTION
- Leave existing levels in place with long term monitoring

CONTAINMENT
- Groundwater Extraction and Treatment
- Air Sparge Curtain

3.2.2 Active Soil and Groundwater Treatment

Provided below are active remediation alternatives to address either the soil or groundwater. Alternatives are as follows:

VOLATILIZATION
- Soil venting only
- Soil venting with groundwater extraction
- Soil venting with air sparging

EXCAVATION
- Soil removal and disposal

EXTRACTION
- Groundwater pumping

DEGRADATION
- Ozone injection

3.3 Screening of Alternatives

3.3.1 Non-Treatment of Impacted Soil and Groundwater

3.3.1.1 Description

The no action alternative will require long-term groundwater gauging and/or sampling on a periodic basis (possibly quarterly) to track the movement of the COIs. Deed restrictions will be required for the site that prohibit the installation of an on-site water supply well and excavation activities in the western portion of the site. The site will also have to remain zoned for commercial/industrial use. Institutional controls restricting the installation of water supply wells off-site to the southeast and south would also be required. Use of this alternative also assumes the COIs will naturally attenuate through biodegradation and dispersion.

Containment technologies, such as groundwater interceptor wells or an air sparge curtain, also may place a restriction on the land. The purpose of the containment technologies is to intercept the COIs before they migrate off-site in the groundwater. Typically, a line of extraction wells or air sparge wells is placed along the downgradient property line. Groundwater is either pumped from the aquifer and treated (extraction) or stripped of the COI in place (air sparge). On-site deed and zoning restrictions would be similar to the no action approach. The sale of the land may be restricted after a containment technology is implemented stating the technology may not be removed and must continue to be maintained.

3.3.1.2 Screening

3.3.1.2.1 Applicability

The no action and containment treatment options were considered not applicable (AP 0-2). These alternatives do not reduce the mobility, destroy, or reduce the volume of contaminants. It is unlikely that the City of Indianapolis (property to south) or residents to the southeast would be willing to deed-restrict their properties.

3.3.1.2.2 Protection of Public Health and the Environment

These alternatives are not in the best interest of the public health or the environment in this situation (HE 1-2). The assessment to determine the horizontal and vertical extent of impact indicated possible impact to the Little Eagle Creek, although risk assessment determined no unacceptable risks.. Additionally, monitoring wells located off-site to the southeast of the property indicated levels above federal MCLs. Due to the possibility that a water supply well could be installed off-site, this course of action is not recommended.

Discussions with Marion County Health Department personnel indicated that there are no ordinances prohibiting the installation of a water supply well on private property in Indianapolis. However, Section 18-803 of the County Health Code states that the Health Department can prohibit the installation of water supply wells in areas where groundwater has been determined to be contaminated by chemical, biological, or radiological contaminants. Sherry Winters, Field Supervisor, indicated, however, that if "chemical contamination" were detected in a newly installed well, they could ask the owner to connect to public water supply if it were available (within 100 feet). However, since the water supplier is a private company they could not automatically make someone use the water supply.

3.3.1.2.3 Cost

The costs for continued monitoring are minimal on an annual basis, but can be substantial in the long term due to perpetual monitoring requirements.

Containment controls would cover the horizontal extent both on the southern and eastern property lines. Capital, installation, and one year of operation and maintenance costs could range from $200,000 to $400,000 for groundwater extraction and treatment and $100,000 to $300,000 for an air sparge curtain. The concentrations of chlorinated solvents in the groundwater may also require the use of an air stripper before carbon polishing in the groundwater extraction and treatment option.

3.3.1.2.4 Administrative considerations

These technologies were considered to require normal or no administrative oversight (AC 2-3). The following administrative controls were identified:

Continued monitoring:

- quarterly or periodic reporting (to client and regulatory agency)
- sampling/purge water drum disposal or permit to discharge

Institutional actions:

- possible public hearings
- continued communication with regulatory agency providing necessary documentation for re-zoning or deed restriction as required by agency

Containment:

- water discharge permitting either storm or local sanitary sewer
- quarterly or periodic reporting (to client and regulatory agency)
- site safety plan
- engineering wells, equipment, and piping design
- engineering operation and maintenance manual

3.3.1.2.5 Treatment Time

The technologies were considered to have treatment times either longer than desired or acceptable (AC 1-2), for no action and containment, respectively.

3.3.2 Active Soil and Groundwater Treatment

Active soil and groundwater treatment can be accomplished by several methods including soil venting, soil venting combined with air sparging, soil venting combined with groundwater extraction, soil excavation and disposal, groundwater pumping alone, and contaminant degradation. These options are discussed in the following sections.

3.3.2.1 Description

Volatilization is the process of removing the contamination from the saturated or unsaturated zone via the vapor phase. Volatilization of adsorbed phase contaminants in the unsaturated zone typically involves soil ventilation. Soil venting (soil vapor extraction) removes VOCs from vadose zone soils by inducing air flow through the impacted areas. Venting is typically performed by applying a vacuum to vertical vapor extraction wells screened through the level of soil contamination using a vacuum blower. The resulting pressure gradient causes the soil gas to migrate through the soil pores toward the vapor extraction wells. VOCs are volatilized out of the subsurface and converged to the surface by the migrating soil gas.

A process that volatilizes both adsorbed phase contaminants in the saturated and unsaturated zones and dissolved phase contaminants in the saturated zone is air sparging with soil venting. Air is forced under low pressure through a 1 to 2 foot section of well screen into the saturated zone generally at a point 5 to 20 feet below the vertical extent of impact. Sparging creates air-filled porosity in the saturated zone which facilitates direct volatilization of contaminants from saturated soil and removes VOCs from groundwater. The turbulence created by sparging improves mixing in the saturated zone which increases the transport of contaminants from saturated soils to groundwater.

A less-often used technology is vertical circulation wells that extract groundwater at the well bottom, air-strip within the well to remove VOCs, and finally discharge the treated groundwater through the top of the well at the water table. This is also known as "in-well sparging" technology. Several methods can be used to induce vertical flow within the well and thereby create the circulation cell within the aquifer in the vicinity of the well. Vapors generated within the well are removed, treated, and discharged.

Vertical circulation wells are not appropriate because, as an emerging technology, it is not widely used and does not have a proven track record. Furthermore, this technology is essentially a groundwater pump, treat, and reinject system without the use of submersible pumps or air stripper. As with conventional pump-and-treat systems, groundwater cleanup times and their effectiveness are diffusion-limited resulting in ineffective and long clean-up times.

Excavation involves removing soil from the impacted area using heavy machinery. The horizontal and vertical extent of impact is first identified. Heavy machinery is then used to remove the impacted soil while pumps extract the exposed groundwater. The soil is typically placed directly in the back of a staged truck while the groundwater is treated via activated carbon and discharged. The excavated soil is taken to off-site facilities and treated. The excavated soil is replaced with clean backfill. The on-site remediation of the soil requires equipment capable of processing several thousand cubic yards of soil and is not feasible for this site.

Extraction of groundwater is historically the most common remedial technology addressing dissolved phase contaminants. This technology employs either surface mounted or downwell pumps. Recovery wells are placed either within the impacted groundwater or perpendicular to the groundwater gradient at the leading edge of impacted groundwater. Downwell pumps extract the groundwater and convey it to an on-site treatment facility. This technology addresses only groundwater contamination. Vadose zone soils are not remediated.

Advanced oxidation processes degrade aqueous contaminants by reaction with hydroxyl radicals. The hydroxyl radicals are typically produced using ozone and/or hydrogen peroxide. Ozone is a highly reactive form of oxygen which reacts preferentially with organic compounds containing a double bond structure (unsaturated). Compounds with this double bond structure include chlorinated solvents. Ozone is injected into the aquifer at or below the vertical extent of contamination using an ozone generator.

3.3.2.2 Screening

3.3.2.2.1 Applicability

Of the alternatives evaluated, the only two that are the most applicable are soil venting with groundwater extraction and soil venting with air sparging (AP 5, see Table 2)). Excavation is not considered feasible (AP 2) due to the value of soil requiring removal, treatment, and disposal near MW-132 and SB-150 (approximately 250 cubic yards). Also, the more favorable technologies are able to remediate the soil as part of their overall operation. Groundwater pumping alone is also feasible (AP 3) and could place control on the movement of groundwater, but it will not address the impacted soil which would continue to contribute to the groundwater contamination. Like groundwater extraction, soil venting only (AP 2) will address only one phase of the contamination; the adsorbed phase chemicals in the unsaturated zones.

3.3.2.2.2 Protection of public health and the environment

The in-situ treatment technologies that are most feasible in this situation are inherently more protective of human health (HE 3) than ex-situ technologies such as excavation (HE 2). Excavation would require the use of heavy machinery and often leads to the uncontrolled release of dust and vapors from the excavations. The water and air discharge from an in-situ technology are regulated by state agencies to protect the public health and the surrounding environment.

3.3.2.2.3 Cost

A volatilization technology requires the installation of wells, trenching, and an operating system after completing a full design. Capital, installation, and one year of operation and maintenance costs for a volatilization system range from $100,000 to $300,000 with soil venting only as the least expensive. Soil venting with groundwater removal or air sparging are more expensive technologies.

A groundwater-only pumping system is less expensive than volatilization with a range of $100,000 to $300,000 for capital, installation, and one year of operation and maintenance. However, these systems often require significantly longer periods of operation than more aggressive treatments such as soil venting and air sparging and have higher overall annual operation and maintenance costs.

Excavation and disposal of impacted soils above cleanup goals cost ranges from $100,000.00 to $300,000.00. However, soil excavation alone does not address current groundwater impacts.

The costs for installing and operating an ozone injection system is expected to be greater than $500,000 for capital, installation, and one year of operation and maintenance.

Any system removing groundwater will most likely require the use of either an aqueous phase granular activated carbon (GAC) treatment or other technology prior to discharge to meet effluent standards. An alternative to GAC for groundwater treatment is an air stripper, however, these units require significant additional maintenance and there is a potential for more frequent discharge excursions. Groundwater removal may also require the use of an air stripper prior to carbon polishing based on some of the concentrations of chlorinated compounds in the groundwater.

3.3.2.2.4 Administrative considerations

Each alternative scored the same regarding administrative considerations (AC 2). Any system requiring the removal of soil vapors or groundwater will require discharge permitting, mass removal tracking, monthly or quarterly reports, engineering design and equipment sizing. Excavation will require classification permitting and disposal permitting along with typical excavation reports. Ozone injection may require special permitting but it is highly reactive and has a limited life in the usable form. Extra site safety controls would be necessary, however, for on-site personnel performing operation and maintenance tasks within the remediation treatment facility

4.0 TREATABILITY INVESTIGATIONS

4.1 Introduction

Treatability investigations are used to determine the feasibility of a proposed remedy and to provide data for remedial design purposes. A review of historical site data indicates no treatability investigations have been conducted at this site.

4.2 Pilot Scale Test

Based on the screening of technologies and the potential applicability of air sparging with soil venting , Fluor Daniel GTI conducted a pilot scale test using this technology. On February 24, 1997, a soil venting (SV), air sparge (AS), and combined AS/SV pilot test was conducted in the southeastern portion of the site. The objectives of the pilot testing were as follows.

- evaluate the technical feasibility of using the AS/SV technology at the site
- determine the radius of influence for single-well SV test
- determine the radius of influence for single-well AS test
- estimate flow rates and VOC emission rate during a combined AS/SV test

The nested well SP1 was used for the pilot tests. The well is constructed of a 1-inch diameter PVC sparge point screened from 23 to 25 feet below ground (bg) and a 4-inch diameter PVC vent well screened from 5 to 15 feet bg. The three 2-inch diameter PVC observation wells OB-1, OB-2, and MW-10 were used, they are located 5, 10 and 20 feet from SP1, respectively. OB-1 is screened from 5 to 15 feet bg, OB-2 from 5 to 15 feet bg, and MW-10 from 7 to 17 feet bg.

4.2.1 Soil Vent Pilot Test Methods and Results

The first test conducted was a step-vacuum soil vent test using a 1.0 Hp Rotron regenerative blower to apply a vacuum to SP1 at settings of 7, 14, and 21 inches of water. The steps were conducted for 30, 15, and 15 minutes, respectively. Corresponding air flow rates, measured at the wellhead using a differential flow sensor, were 63, 88 and 137 scfm, respectively. Vapor concentrations in the effluent were 1.2 ppmv and 4.0 ppmv for the first step and third step, respectively.

The pretest depth to water was 13.50 feet below the top of casing. The well is screened from 7 to 17 feet below grade and has about a 3-foot stickup yielding an available screen interval of 3.5 feet. Observation well vacuum is summarized in **Table 4**. **Figure 4** shows a plot of vacuum versus distance for each vacuum setting with linear and logarithmic scales presented in the upper and lower plots, respectively.

The vacuum radius of influence (ROI) is defined as the distance at which subsurface vacuum equals 0.1 inches of water. The ROI is calculated at 25, 28, and 29 feet for vacuum settings of 7, 14, and 21 inches of water, respectively. A design flow rate of 88 scfm per extraction well (25 scfm per foot of screen) at a vacuum of 14 inches of water will produce an ROI of 28 feet.

Short-term SV tests were conducted in wells MW-132, MW-153, and MW-154. Only about one foot of screen was exposed at MW-132 which was insufficient to conduct a test due to upwelling of the water table. At 45 inches of water, a flow rate of 88 scfm was recorded at MW-153. The available screen interval was about 3.5 feet which yields 25 scfm per foot of well screen. An air sample collected after ten minutes was non-detect for VOCs. At 65 inches of water, no measurable flow was observed in MW-154. The available screen was 8 feet. These results suggest that adequate air flow rates can be achieved at most locations across the site except in the extreme northwest portion due to greater amounts of clay and silt in the vadose zone.

4.2.2 Air Sparge Pilot Test Method and Results

The second test was an air sparge test conducted on the SP1 sparge point. Using a portable compressor, an air flow of 9.5 standard cubic feet per minute (scfm) at a pressure of 4.8 pounds per square inch (psi) was applied to SP1. During the sparge test, depth to water, dissolved oxygen, and pressure measurements were recorded at OB-1, OB-2, and MW-10. The test data is summarized in Table 5. The results for dissolved oxygen, pressure, and upwelling (change in depth to water from static) are illustrated in **Figure 5** for each parameter versus time and distance.

Dissolved oxygen concentrations increased within 10 minutes in OB-1 and OB-2. There was a delay of about 40 minutes before an increase was observed in MW-10. Dissolved oxygen concentrations stabilized in all observation wells within 60 minutes. Dissolved oxygen increased above pretest levels by 2.5 mg/L in OB-1, 3 mg/L in OB-2, and 2 mg/L in MW-10.

Air pressure in the unsaturated zone increased throughout the test in OB-1 and OB-2, observed pressures in MW-10 initially increased but appeared stable throughout the test. At 52 minutes, pressures were 0.22 inches of water in OB-1, 0.09 inches of water in OB-2, and 0.075 inches of water in MW-10.

Depth to water was measured to record any increase in the water table elevation. During the early stages of injecting air below the water table, the water table rises (upwells) in the vicinity of the sparge well. As preferential air channels develop, the upwelled area collapses and begins to return to static or near-static levels. Maximum upwelling was recorded at 37 minutes with 0.75 feet in OB-1, 0.97 feet in OB-2, and 0.44 feet in MW-10. Within 65 minutes, the upwelled area collapsed to 0.3 feet in OB-1, 0.42 feet in OB-2, and 0.21 feet in MW-10. Upwelling was greater at a radial distance of 10 feet from SP1 in OB-2 than at OB-1 which is located at 5 feet. This may indicate preferential flow in the direction of OB-2 due to heterogeneities in aquifer materials.

Dissolved oxygen is the primary indicator of sparging ROI with pressure and upwelling providing qualitative indications of ROI. Analysis of these parameters indicates an ROI of 20 feet is possible at an air flow rate of 9.5 scfm at 4.5 psi.

4.2.3 Combined AS/SV Test

After about 60 minutes of continuous air sparging, the vapor extraction blower was activated to conduct the combined AS/SV test. Concentrations in vapors from SP-1 after approximately 30 minutes of the combined test were 10 ppmv based on FID readings. An air sample was also collected in a Tedlar bag and sent for analysis of VOCs using EPA Method TO-14. VOC emission rates could not be evaluated because analytical results were non-detect for all analytes. Possible reasons for not detecting VOC vapors in the effluent include: (1) VOC concentrations in soil in the southeastern area are relatively low, (2) a longer test may have been needed, or (3) leakage around the test well may diluted the effluent air stream. Regardless, the primary goal of the test was to investigate the applicability of AS/SV at the site. The pilot test results demonstrate that this is a viable technology given the site hydrogeologic conditions.

5.0 DETAILED ANALYSIS OF ALTERNATIVES

5.1 Introduction

The previous section identified and screened potential technological alternatives and provided two viable options for site remediation. The objective of the following detailed analysis of alternatives is to describe in detail and rank, the two options.

5.1.1 Overview of Detailed Analysis and Criteria

The two corrective measure alternatives identified in the previous section are evaluated and ranked for their suitability in remediating soil and groundwater at the site. The basic mechanism for the screening process is a subjective rating system where each feasible technology is compared on a relative basis with regard to the site conditions and the following considerations:

- Applicability;
- Protection of public health and the environment;
- Cost; and
- Administrative considerations.

5.2 Individual Analysis of Alternatives

5.2.1 Soil Venting with Groundwater Extraction

5.2.1.1 Description

Soil venting with groundwater extraction simultaneously removes fluids and vapors from either a single extraction well or separate venting and groundwater pumping wells thereby addressing both the saturated and unsaturated zones. The SVE removes VOCs from the unsaturated zone by inducing air flow through contaminated areas. Soil vapor extraction is typically performed by applying a vacuum to vapor extraction wells screened through the level of adsorbed phase contamination. The resulting vacuum gradient causes the soil gas to migrate through the soil toward the vapor extraction wells. VOCs are volatilized by the passing air and conveyed to the subsurface by the migrating soil gas.

Groundwater extraction is accomplished by use of either a single submersible electric pump or pneumatic suction pump at the surface, using a variety of equipment. Soil vapors can be recovered from the pumping wells. However, based on known site conditions, separate groundwater pumping and vapor extraction wells are needed. This is because a greater number of VES wells are required compared to groundwater wells. Recovered groundwater is treated via air stripping or liquid phase granular activated carbon (GAC). Air stripping involves the physical removal of a VOC from the water stream. This is accomplished by cascading the water stream over a counter-current stream of air. Packing material in the stripper provides additional

surface area to improve the removal process. Air stripping is a preferred technology when the groundwater pumping rate and dissolved VOC concentrations are relatively high and dissolved metals concentrations are relatively low. Iron fouling due to oxidation can become a maintenance issue.

Liquid-phase GAC adsorption is the accumulation of a chemical from a liquid phase onto the surface of the carbon. The adsorptive properties of GAC are due mainly to its highly porous structure and resulting large surface area. Contaminated water is generally treated by passing it through two vessels containing GAC arranged in series. The first vessel acts as the primary treatment unit and the second acts as a polishing treatment unit. When the primary vessel becomes saturated, it is removed and is replaced with the secondary vessel. A fresh carbon drum is placed in the secondary position. This process is repeated when the primary vessel reaches saturation. Liquid phase carbon adsorption is the preferred water treatment technology when dissolved VOC concentrations and groundwater pumping rate are relatively low.

5.2.1.2 Soil Venting with Groundwater Extraction Criteria

5.2.1.2.1 Applicability

Groundwater extraction with soil venting could be implemented in both areas of concern. Groundwater extraction would be used to treat dissolved VOCs in both areas. Soil venting would be used to treat VOCs in soil in the western area only. Groundwater extraction and treatment is a widely used technology for the treatment of VOCs in groundwater in hydrogeologic settings similar to the site. Groundwater pumped form the subsurface is treated and discharged to a publicly owned treatment works (POTW) or to the surface with appropriate permitting. The water stream is typically treated using air stripping or liquid phase GAC. Based on assumed pumping rates and potential VOC concentrations, the air stripping technology would likely be employed. Soil venting is a widely used technology to address VOC occurrence in soil. Based on the VOC recovery rates, off-gas treatment of the emissions may or may not be required.

5.2.1.2.2 Protection of Public Health and the Environment

Since this technology extracts volatilized vapors, it may require an off-gas treatment technology such as vapor phase carbon adsorption to prevent migration of the vapor plume into the residential areas. Since this technology also extracts groundwater, treatment prior to discharge will be required.

5.2.1.2.3 Cost

The number of extraction wells depends on the groundwater capture radius for each well. The analytical solution for a single pumping well in a uniform flow field as calculated in the computer program DREAM (Round and Bonn, 1994) was used to estimate capture radius. Program input included site-specific hydrogeologic parameters as used in the AT123D model (refer to Section 2.1.2.2) for hydraulic conductivity, aquifer thickness, and hydraulic gradient. For the selected pumping rate of 20 gallons per minute, the

resulting well drawdown was about 3 feet with a capture radius of 40 feet (which is a well spacing of 80 feet).

Based on the groundwater capture radius of 40 feet, approximately 16 pumping wells would be required for the two areas. Five soil venting wells should cover the area of soil treatment in the western portion of the site. Separate equipment compounds would be installed in each area. The estimated cost for the capital purchase, installation and operation of a groundwater extraction with soil venting system could range from $400,000 to $510,000. Annual operation and maintenance of the system could range from $90,000 to $110,000. Routine maintenance is required for air strippers (acid wash or replacement), downhole pumps (maintenance/replacement), and liquid phase GAC replacements. This estimate does not consider off-gas treatment of emitted vapors.

5.2.1.2.4 Administrative Considerations

Soil venting w/ groundwater extraction requires the following Administrative Considerations:

- air discharge permitting
- air discharge sampling
- groundwater sampling
- groundwater discharge permitting (storm or sanitary sewer)
- Monthly or quarterly reporting (to client and regulatory agency)
- site safety plan
- engineering / piping, wells, blower, pump design
- engineering operation and maintenance manual
- mass removal tracking

5.2.2 Soil Venting with Air Sparging

5.2.2.1 Description

Air sparging enhances desorption of both adsorbed phase and dissolved phase contaminants in saturated soils and groundwater through volatilization. Sparging involves the forcing of air under pressure through a well screened below the vertical extent of contamination. Dissolved contaminants with high Henry's Law coefficients are volatilized and stripped by the passing air stream and carried into the vadose zone. To be physically removable by sparging, contaminants should have a dimensionless Henry's Law constant >0.01 and a vapor pressure >1 mm Hg. Compounds amenable to air sparging include the chlorinated compounds present at this site including TCE, cis-1,2-DCE.

In order for sparged air to penetrate the soil matrix, hydraulic conductivity should be $>10^{-5}$ cm/sec. In addition, sparging is most efficient when there are no continuous lenses with significantly different permeability in the saturated zone and when permeability in the saturated zone does not increase with depth. Air sparging is often coupled with an SVE technology to control the release of liberated vapors.

This technology is best suited to homogeneous saturated zones, volatile contaminants, saturated thicknesses greater than five feet, and a subsurface geology conducive to capture and control of the liberated vapors. The requirements are reasonably met by site conditions.

5.2.2.2 Soil Venting and Air Sparging Criteria

5.2.2.2.1 Applicability

Air sparging combined with soil venting could be implemented in both areas of concern. Soil venting would be used to control liberated vapors in both areas. It would also be used to address VOCs occurrence in soil in the western area.

The impacted saturated zone at the site mainly consists of homogenous sands with an upper layer of discontinuous silts and clays. The high permeability of the sands is conducive to air sparging. The clay and silt strands may produce channeling through or around these areas. Cyclical sparging should be used at this site to maintain sparging efficiency by limiting the channeling of air. The chemicals of concern are spargeable and the saturated thickness of ten feet or more provides the necessary area for effective air sparing with soil vapor extraction control. The pilot test conducted at the site indicated a sparging radius of influence of 20 feet and a soil venting radius of influence of 28 feet.

No additional water treatment process equipment is required because the combination of air sparging with soil venting does not extract groundwater. This technology may require a barrier groundwater well for additional hydraulic control due to several factors. One factor is possible groundwater mounding and subsequent contaminant migration caused by air sparging. Groundwater mounding is a local increase in the groundwater level caused by the upward pressure of the injection of air into the groundwater. This changes the local direction of flow of groundwater. However, under cyclic operation and low injection pressures, this effect is found to be localized and temporary. Additional factors are the proximity of the creek and the residential neighborhood to the area being treated.

5.2.2.2.2 Protection of Public Health and the Environment

Because of the presence of the clay and silt stringers, additional soil vapor extraction wells [beyond what would be required in a homogenous sand lithology] may be necessary to control liberated vapors along the residential neighborhood perimeter. Sparging causes the vertical movement of contaminants as bubbles move from the saturated zone upward into the unsaturated zone where they are captured as soil gas by the soil venting system. However, when there is a confining layer, such as silt or clay through which the bubbles can not travel, the contaminant bubbles may migrate laterally underneath the confining layer until they can again move upwards to the unsaturated zone. It should be noted that the soil venting radius of influence measured at the site is greater than the sparge radius and conventional system designs extract about three to five times the volume of air that is injected. This practice minimizes or eliminates the possibility of fugitive soil gases migrating into residential areas.

5.2.2.2.3 Cost

Based on an air sparge radius of influence of 20 feet, approximately 30 nested AS/SV wells would be required in the western area and 22 nested wells would be required in the southeastern area. Separate equipment compounds would be installed in each area. The preliminary engineering estimated cost for the capital purchase, installation, and operation of an AS/SV system for one year could range from $410,000 to $460,000. Annual operation and maintenance of the system could range from $65,000 to $95,000. This estimate does not consider off-gas treatment of emitted vapors.

5.2.2.2.4 Administrative Considerations

The following Administrative considerations were identified for soil venting w/air sparging:

- air discharge permitting
- air discharge sampling
- Monthly or quarterly reporting (to client and regulatory agency)
- site safety plan
- engineering / piping, wells, blower, compressor design
- engineering operation and maintenance manual
- mass removal tracking

5.3 Comparative Analysis of Alternatives

There are two major areas of concern at the site. COI are present in the groundwater at both areas above cleanup goals. COI are present above cleanup goals in the soil only in one area. A potential remediation technology must be able to address all phases of interest and be able to bring the dissolved COI concentrations at the property boundary to within levels in a cost-effective manner. The two technologies which have the most potential are soil ventilation with air sparging and soil ventilation with groundwater extraction.

Based on the findings of the technology screening, the two technologies appear to cost approximately the same to design and install. However, permitting, operation, and treatment costs would be higher for the soil vapor and groundwater extraction approach. In addition, the expected life cycle (cleanup time) of the soil vapor and groundwater extraction system would be longer (estimated at least 10 years) than the soil venting and air sparging system (estimated at 3 to 5 years), thereby yielding a much larger total cost. Soil venting with air sparging will not require water management while soil venting with groundwater extraction will. Several options exist with this technology. Both technologies may require vapor treatment prior to discharge. Results of the air sparging with soil venting pilot test indicate this is a feasible technology for the site.

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TABLES

TABLE 1
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

1. Chemical Specific

- Safe Drinking Water Act (SDWA) (42 U.S.C. 300(f))
  - •National Primary Drinking Water Standards (40 CFR Par 141)
  - •Maximum Contaminant Levels, (chemicals, turbidity, and microbiological contamination) (for drinking water or human consumption) (40 CFR 141.11-141.16)
  - •Maximum Contaminant Level Goals (40 CFR 141.50-141.51, 50 FR 46936)
- Indiana Drinking Water Quality Standards (327 IAC 8)
- Clean Air Act (CAA) (42 U.S.C. 7401)
  - •National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61)
- Indiana Regulations for Establishing Emission Levels for Volatile Organic Compounds (VOCs) (326 IAC 2 and 8)
- Clean Water Act (CWA) (33 U.S.C. 1251)
  - •Federal Water Quality Criteria (Section 304)
- Indiana Department of Environmental Management (IDEM) Voluntary Remediation Program (VRP) (Indiana Code 13-25-5)

2. Action Specific

- CWA (33 U.S.C. 1251)
  - •National Pollutant Discharge Elimination System (NPDES) Permit Regulations (Section 402 and 40 CFR Parts 122 and 125)
  - •State Enforcement Jurisdiction (40 CFR Part 131)
  - •Sample Preservation Procedures (40 CFR Part 136)
- CAA Standards of performance for new stationary sources (42 U.S.C. 7411)
- Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C. 6926(b), Section 3006(b))
  - •Definition and Identification of Hazardous Waste (40 CFR Part 261)
  - •Standards for Generators of Hazardous Waste (40 CFR Part 262)
  - •Standards for Transporters of Hazardous Waste (40 CFR Part 263)
  - •Land Disposal Restrictions (LDRs) (40 CFR Part 268)
  - •Approved State Hazardous Waste Management Programs (Indiana) (40 CFR Part 272.750-272.751, Subpart P)
- Department of Transportation Rules for the Transportation of Hazardous Materials (49 CFR Parts 107, 171.1-172.558)
- Occupational Safety and Health Act (OSHA) Regulations for Workers Involved in Hazardous Waste Operations (29 CFR Part 1910)
- Endangered Species Act of 1973 (16 U.S.C. 1531, generally 50 CFR Parts 81, 225, 402)
- Fish and Wildlife Coordination Act (16 U.S.C. 661)

- Fish and Wildlife Improvement Act of 1978, and Fish and Wildlife Act of 1956 (16 U.S.C. 742a)
- Fish and Wildlife Conservation Act of 1970 (16 U.S.C. 2901, generally 50 CFR Part 83)
- Farmland Protection Policy Act (7 U.S.C. 4201, generally 7 CFR Part 658)
- Indiana Regulations for Spills of Oil and Other Objectionable Substances: Reporting, Containment and Cleanup (327 IAC 2-6)
- Indiana Regulations for the Treatment and Disposal of Hazardous Waste (329 IAC 3.1)
- Indiana Regulations for the Permitting of Air Strippers (326 IAC 2 and 8)
- Indiana Regulations for Construction Permits for Water Treatment Facilities (327 IAC 3)
- Indiana NPDES Permit Regulations (327 IAC 2 and 5)
- Indiana Regulations for the Registration of Groundwater Extractions Wells Which have a combined capability of pumping greater than 70 gallons per minute (Indiana Code 13-2-6.1)
- Indiana Fugitive Dust Rules (326 IAC 6)
- Indiana Incinerator Rules (326 IAC 4)
- Indiana Final Rules Concerning the Regulation of Water Well Drilling (310 IAC 16)
  •Rules Regarding Permanent Abandonment of Wells (310 IAC 16-10-2)

3. Location Specific

- Construction Within 100-year Floodplain (40 CFR Part 264)
- U.S. EPA's Statement of Procedures on Floodplain Management and Wetland Protection (40 CFR Part 6, Appendix A)[1]
- Indiana Regulations Governing Construction in a Floodway (Indiana Code 13-2-22)
- Marion County Regulations **Governing Construction in a Floodway (Indiana Code 13-2-22)**

4. To Be Considered (TBC) Criteria

a. U.S. EPA RCRA Guidance Documents
   - RCRA Design Guidelines
   - Permitting Guidance Manuals
   - Technical Resource Documents (TRDs)
   - Test Methods for Evaluating Solid Waste

b. U.S. EPA Office of Water Guidance Documents
   - Pretreatment Guidance Documents
   - Water Quality Guidance Documents
   - NPDES Guidance Documents
   - Groundwater Guidance Documents
   - Groundwater Protection Strategy (August 1984)
   - Clean Water Act Guidance Documents

b. U.S. EPA Miscellaneous

- SW-846 Methods - laboratory analytical methods (November 1986)
- Lab protocols developed pursuant to Clean Water Act Section 304(h)
- OSWER Directive 9355.0-28 - Control of Air Emissions from **Superfund Air Strippers**

1 - 40 CFR Part 6 Subpart A sets forth EPA policy for carrying out the provisions of Executive Orders 11988(Floodplains Management) and 11990 (Protection of Wetlands)

TABLE 2
TECHNOLOGY SCREENING MATRIX

NON-TREATMENT SOIL AND GROUNDWATER REMEDIATION ALTERNATIVES

TREATMENT OPTIONS	APPLICABILITY 0 - 5 AP	PUBLIC HEALTH and ENVIRONMENT 1 - 3 HE	ADMINISTRATIVE CONSIDERATIONS (high) 1 - 3 (low) AC	TREATMENT TIME 1 - 3 T	COST 1 - 5 C	RATING SCORE 0 - 360 AP * HE * AC * (C + T)	RETAIN? (Yes / No)
1.0 NO ACTION							
1.1 Leave existing levels in place w/	0	1	3	1	.5	0	NO
long term monitoring							
2.0 CONTAINMENT							
2.1 Groundwater Extraction & Treatment	2	2	2	2	2	32	NO
2.2 Air Sparge Curtain	2	2	2	2	3	40	NO

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LEGEND

APPLICABILITY

0 = Not applicable, available, or implementable
1 = Not widely used and probably not applicable
2 = Widely used but probably not applicable, or not widely used and may not be applicable
3 = Widely used but may not be applicable, or not widely used but probably applicable
4 = Widely used and probably applicable, or not widely used but proven and applicable
5 = Widely used, proven and applicable

HEALTH AND ENVIRONMENT
1 = No control heavy impact and exposure
2 = Extensive impact or exposure with controls
3 = Limited impact or exposure with controls

TREATMENT TIME
1 = Treatment time longer than desired
2 = Acceptable treatment time
3 = Rapid treatment

COST (Capital / Installation / 1 yr O&M)
1 = >$500,000
2 = $300,000 - $500,000
3 = $100,000 - $300,000
4 = $30,000 - $100,000
5 = $0 - $30,000

ADMINISTRATIVE CONSIDERATIONS
1 = Extensive administrative oversight
2 = Normal administrative oversight
3 = Little to no administrative oversight

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PREPARED AT GMC COUNSEL'S REQUEST

TABLE 3
TECHNOLOGY SCREENING MATRIX

SOIL and GROUNDWATER TREATMENT--ORGANIC CONTAMINATION

TREATMENT OPTIONS	APPLICABILITY 0 - 5 AP	PUBLIC HEALTH AND ENVIRONMENT 1 - 3 HE	ADMINISTRATIVE CONSIDERATIONS (high) 1 - 3 (low) AC	TREATMENT TIME 1 - 3 T	COST 0 - 5 C	RATING SCORE 0 - 360 AP * HE * AC * (C+T)	RETAIN? (Yes / No)
1.0 VOLATILIZATION							
1.1 Soil ventilation only	2	3	2	1	4	60	NO
1.2 Soil venting with groundwater extraction	5	3	2	2	2	120	YES
1.3 Soil venting w/ air sparging	5	3	2	3	2	150	YES
2.0 EXCAVATION							
2.1 Soil removal and disposal	2	2	3	1	3	32	NO
3.0 EXTRACTION							
3.1 Groundwater pumping only	3	3	2	1	3	72	NO
4.0 DEGRADATION							
4.1 Ozone injection	3	3	2	3	1	72	NO

LEGEND

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APPLICABILITY

0 = Not applicable, available, or implementable
1 = Not widely used and probably not applicable
2 = Widely used but probably not applicable, or not widely used and may not be applicable
3 = Widely used but may not be applicable, or not widely used but probably applicable
4 = Widely used and probably applicable, or not widely used but proven and applicable
5 = Widely used, proven and applicable

HEALTH AND ENVIRONMENT
1 = No control heavy impact and exposure
2 = Extensive impact or exposure with controls
3 = Limited impact or exposure with controls

TREATMENT TIME
1 = Treatment time longer than desired
2 = Acceptable treatment time
3 = Rapid treatment

COST (Capital / Installation / 1 yr O&M)
1 = >$500,000
2 = $300,000 - $500,000
3 = $100,000 - $300,000
4 = $30,000 - $100,000
5 = $0 - $30,000

ADMINISTRATIVE CONSIDERATIONS
1 = Extensive administrative oversight
2 = Normal administrative oversight
3 = Little to no administrative oversight

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FIGURES

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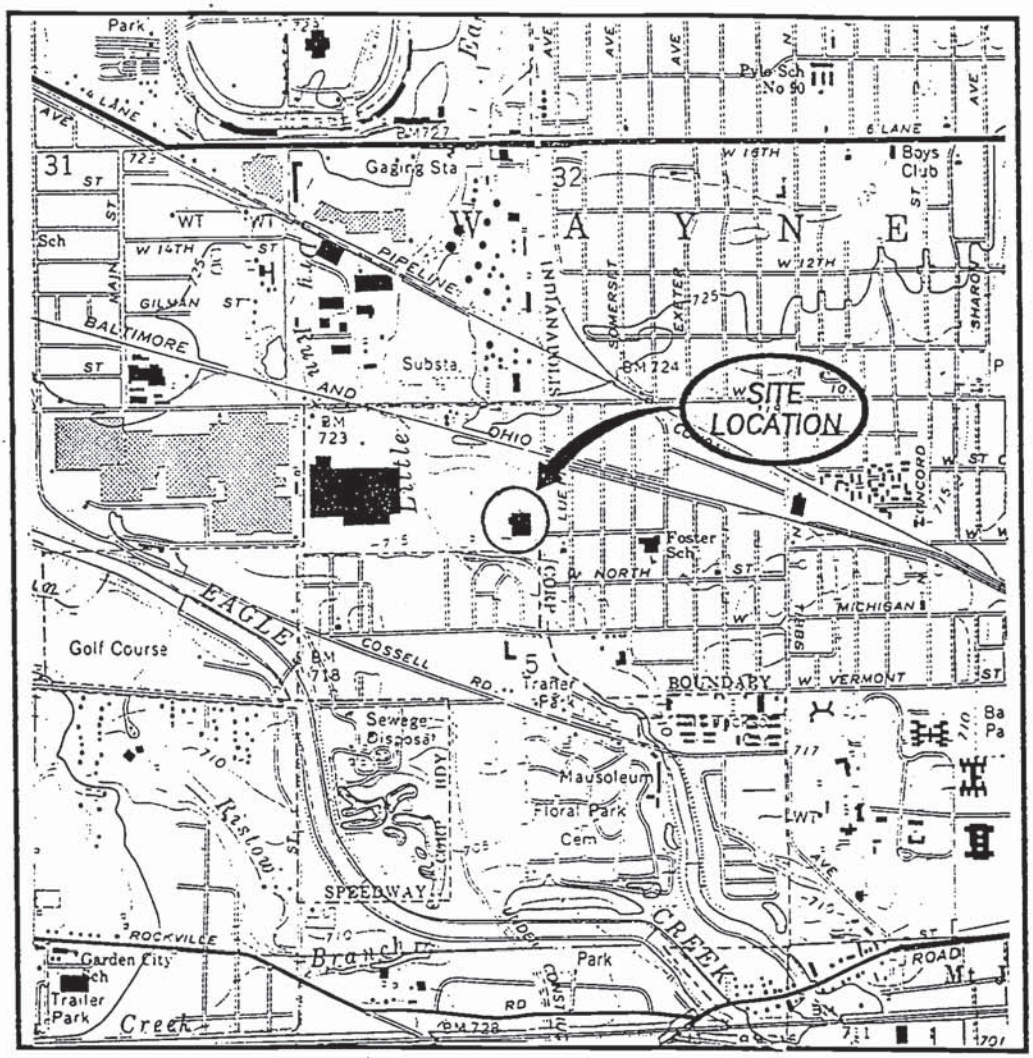


SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
INDIANAPOLIS WEST, INDIANA (1980)

SCALE 1:24,000

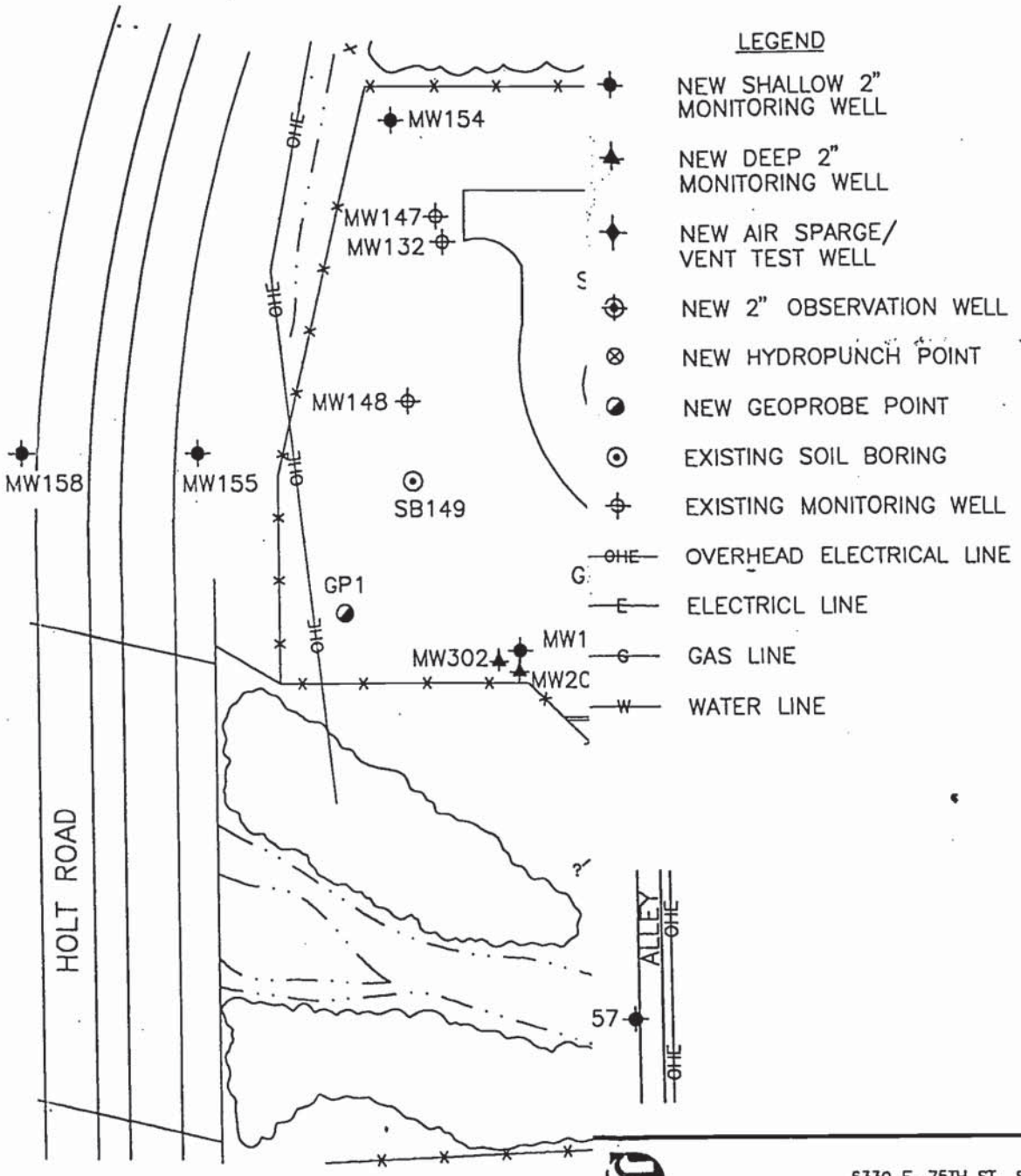
0 1/2 1 MILE

0 2,000 4,000

SCALE FEET

N

FLUOR DANIEL GTI 6330 E. 75TH ST., STE 176 INDIANAPOLIS, IN 46250 (317) 595-6400	DESIGNED: KG DETAILED: KG CHECKED:	**SITE LOCATION MAP**
	CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10	DRAWING DATE: 6/1/95
	LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA	FIGURE: 1



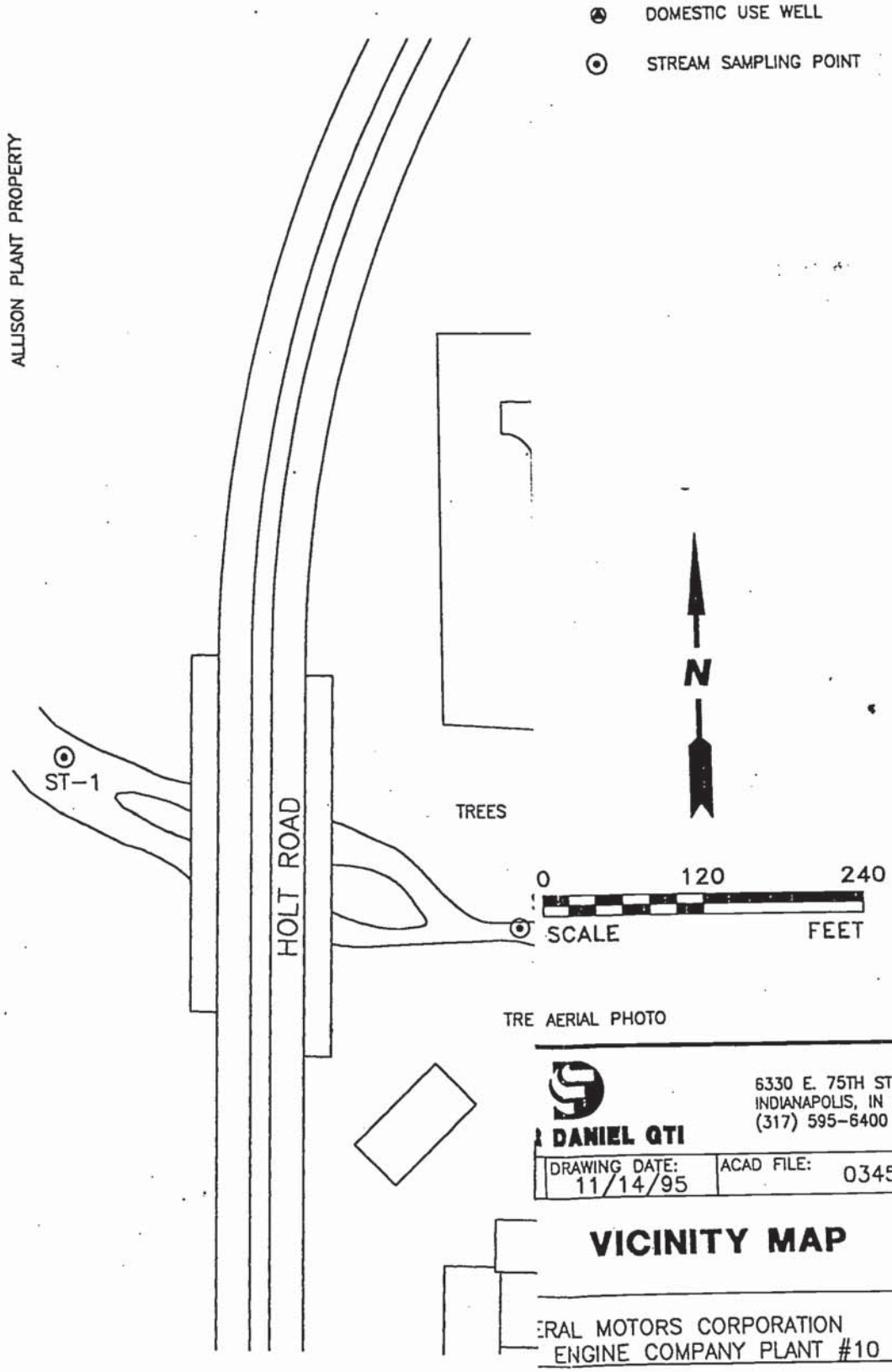
DANIEL QTI

6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

DRAWING DATE: 2/26/97	ACAD FILE: 0262UTIL

SITE MAP

ERAL MOTORS CORPORATION N ENGINE COMPANY PLANT #10		PM: AG
700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA		PE/RG:
DETAILED: PJC	PROJECT NO.: 040020262	FIGURE: 2



DANIEL QTI

6330 E. 75TH ST., STE. 176
INDIANAPOLIS, IN 46250
(317) 595-6400

DRAWING DATE: 11/14/95	ACAD FILE: 0345-VIC

VICINITY MAP

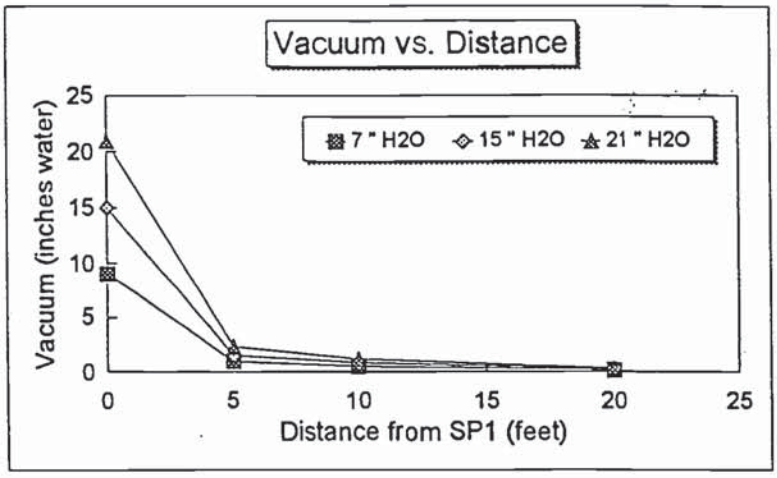
ERAL MOTORS CORPORATION ENGINE COMPANY PLANT #10	PM: AG
00 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA	PE/RG:

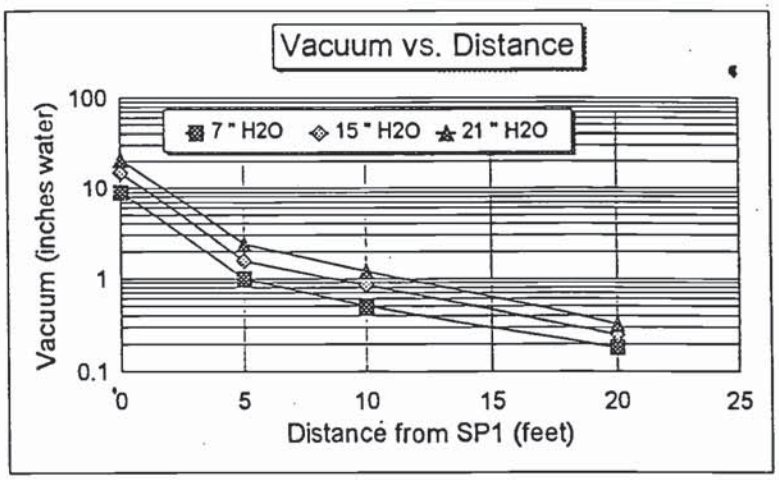
DETAILED:	PROJECT NO.:	FIGURE:
PJC	040020345	3

Figure 4

GM Allison Plant 10

Soil Venting Pilot Test Results





Radius of Influence

Average ROI = 28 feet

Vacuum	ROI (feet)	Correlation Coefficient
7	25.6	0.99
15	27.9	0.99
21	29.4	0.99

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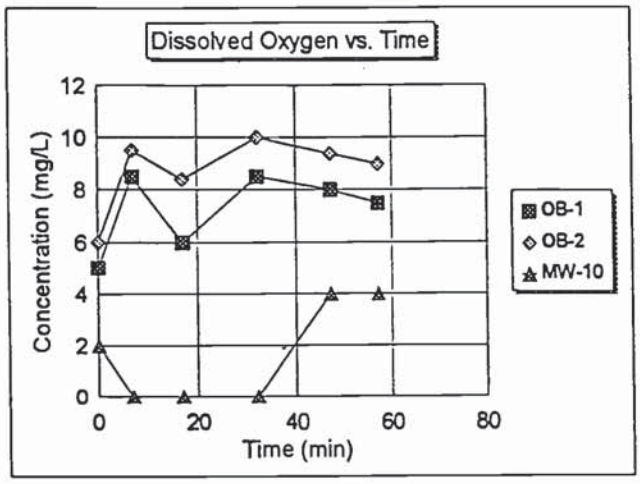
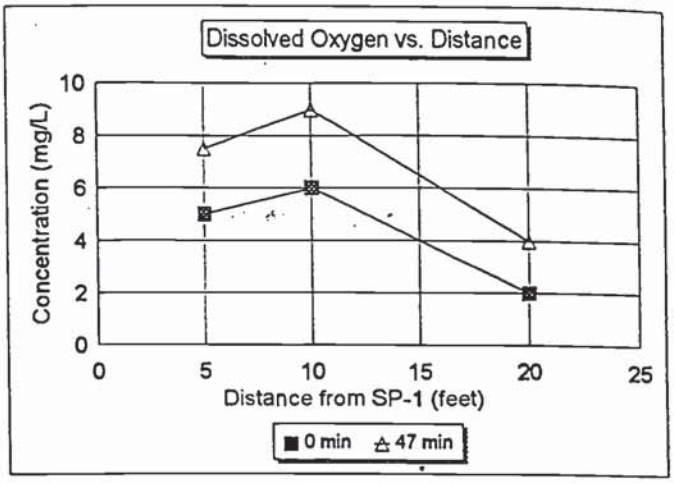
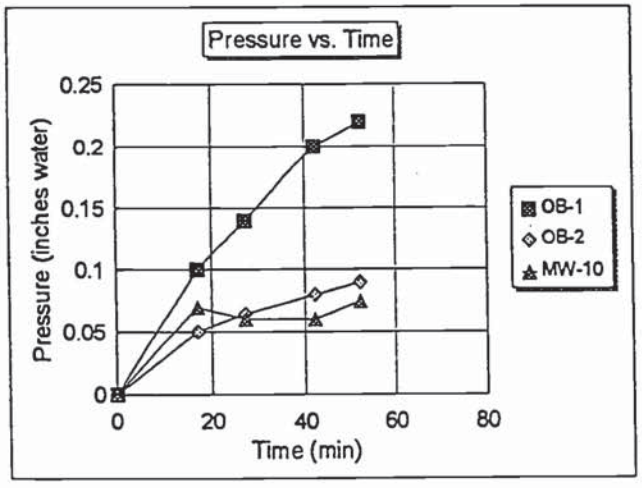
Figure 5

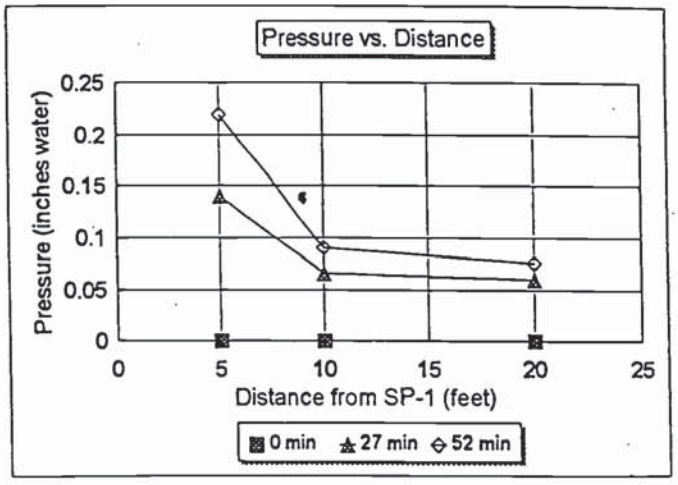
General Motors Corporation - Allison Engine Company Plant 10

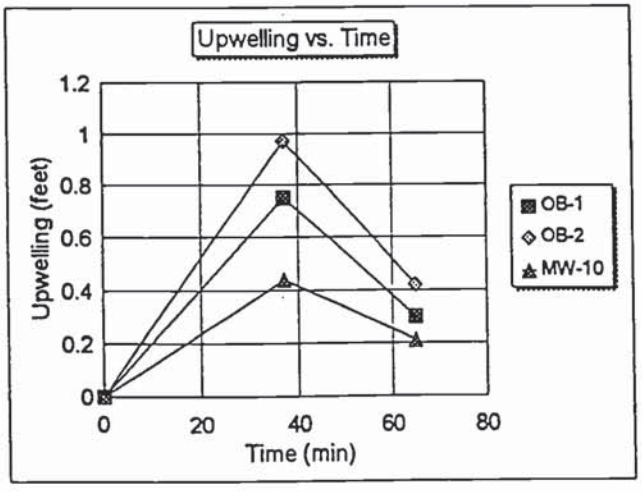
Air Sparge Test Results

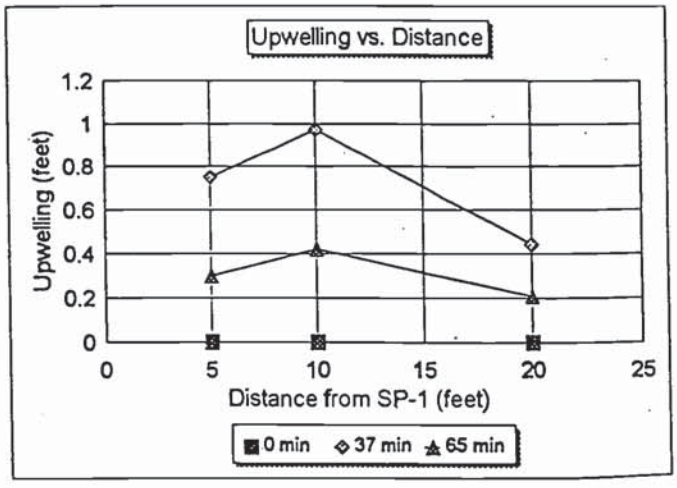












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FLUOR DANIEL GTI

REMEDIAL INVESTIGATION REPORT

General Motors - Allison Plant 10
700 North Olin Avenue
Indianapolis, Indiana

DRAFT

September 19, 1997

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1.0 INTRODUCTION

Fluor Daniel GTI, Inc. has prepared this Remedial Investigation Report for The Allison Engine Company Plant 10 located at 700 North Olin Avenue in Indianapolis, Indiana. The location of the property is depicted on Figure 1. The scope of work has been completed, and when considered as a whole, is consistent with the National Contingency Plan as referenced in 40 CFR 300.700 (Subpart H-Participation by Other Persons). The purpose of the investigation was to better define the magnitude and extent of volatile organic compounds (VOC) in the soil and groundwater and to assess potential environmental risks to their occurrence. Metals in surface soil were also investigated. Objectives of the investigation were to:

1) determine the vertical and horizontal extent and magnitude of VOC occurrence in soil and groundwater at the site.
2) determine the horizontal extent and magnitude of VOC occurrence in soil and groundwater off-site to the east, west, and south.
3) delineate the vertical extent of VOC occurrence in soil and groundwater off-site to the southeast.
4) investigate the presence of VOC in Little Eagle Creek.
5) investigate metals in surface soil on site.
5) assess the potential threat of VOC and metals occurrence to human health and the environment.

Activities completed during the investigation included the advancement of fourteen soil borings, one Hydropunch, and six Geoprobe borings; collection of soil samples for laboratory analysis; the installation of nine shallow and five deep groundwater monitoring wells in the fourteen borings; surveying of all new wells; groundwater elevation monitoring and sampling of all wells on-site; stream survey and sampling of Little Eagle Creek; and rising head permeability tests from the newly installed wells. Results of the investigation were used to more fully characterize the geology and hydrogeology of the site, to further delineate VOC and metals occurrence, and to assess the potential risk of VOC and metals occurrence to human health and the environment.

1.1 Site Description

The subject property is the site of the former General Motors Corporation Allison Gas Turbine Division (AGT) Plant 10. This plant was purchased by General Motors from BHT Corporation (BHT) for use as a warehouse for obsolete machines, tooling, and fixtures in 1973. Prior to 1973, the facility was operated as a carburetor remanufacturing and brake overhaul facility by BHT. The original building was constructed in 1956 and renovated in 1970, doubling the floor space. The facility was used as a warehouse by General Motors until the mid 1980s at which time it became part of the AGT Division and continued to be managed as a warehouse. The property was then sold to the Allison Engine Company in December 1993 as part of the sale of AGT.

1.2 Site Physical Features

The site is located on the southwest side of Indianapolis, Indiana in Marion County on the Tipton Till Plain. The surface topography over most of the site is relatively flat. The southern third of the site slopes moderately to the south, towards Little Eagle Creek. Site elevations range from approximately 715 feet above mean sea level (MSL) at the north end of the property to 705 feet above MSL near Little Eagle Creek.

The site is occupied by a single warehouse. The area surrounding the warehouse is covered by asphalt and concrete. The western and southern sections of the property are grass with wooded areas. A site map showing salient site features is presented as Figure 2.

1.3 Land Use and Population

The property is zoned industrial and is currently leased from Allison Engine Company by a subsidiary of Genuine Parts Company, for use as a warehouse and distribution center. Land use in the surrounding area of the site is mixed use with zoning predominantly residential, general business, and industrial. The property is bordered by a wooded area, Little Eagle Creek, and Michigan Meadows Apartments to the south, a residential neighborhood to the east, a city park (Olin Park) to the north, and Holt Road and an Allison Transmission Plant to the west. Features of the surrounding area are presented on the Vicinity Map (Figure 3).

1.4 Water Resources and Climate

Fluor Daniel GTI obtained all available drilling logs of domestic water wells on record at the Indiana Department of Natural Resources, Division of Water. A total of 160 domestic wells were identified as being located within a one mile radius of the subject site, the nearest of which lies approximately 1,000 feet north (upgradient) of the property. The wells are completed within limestone bedrock, clay, or sand and gravel units at depths ranging from 30 to 270 feet below grade (bg). Records indicate the Allison Transmission Plant across Holt Road to the west has two water supply wells, the nearest of which lies approximately 1,600 feet northwest of the site (cross-gradient). The majority of the water supply wells identified are located to the north, west, and south of the site. A total of 47 municipal or high capacity wells were identified as being located within a two mile radius of the subject site, with 17 of those located within a one mile radius. The nearest of these wells lies approximately 1,400 feet northwest of the site

along Little Eagle Creek (cross-gradient). Refer to Figure 4 for approximate locations of the domestic and municipal wells. The completion logs for the domestic wells are presented in Appendix A.

Potable water is supplied to the area by the Indianapolis Water Company (IWC). The water supply is drawn from numerous wells in the area, the majority of which are located along Eagle Creek approximately 1.5 miles west (upstream) of the subject site. A discussion with the Supervisor of Customer Contact at IWC indicated that residences across Olin Avenue to the east and the Michigan Meadows Apartment complex across Little Eagle Creek to the south are supplied by IWC. A house to house survey of local residences along the east side of Olin and the west side of Luett Avenues was conducted by the Marion County Health Department (MCHD) in December, 1996. A single domestic well was located at 709 North Olin Avenue. The construction of the well is unknown. This well was not identified during the well search conducted at the Department of Natural Resources. Only well logs completed by the drillers and submitted to IDNR are found in the IDNR's files. The approximate location of this domestic well is provided on Figure 3. The well was sampled by MCHD on January 2, 1997. The analytical results indicate that volatile organics are not present in this water supply. These results are included in Appendix B.

The nearest body of surface water is Little Eagle Creek located adjacent to the southern property boundary. This creek flows towards the east-southeast and eventually joins with Eagle Creek approximately one mile to the south of the site.

Indianapolis has a temperate climate with warm summers and no dry season. Precipitation is distributed fairly evenly through out the year. The average precipitation is 39.99 inches per year and the average annual temperature is 52.5° F. (NOAA, 1989). Over a 29 year period from 1960 to 1989 the average monthly rainfall ranged from a low of 2.69 inches in October to a high of 4.03 inches in June. Average temperature for the same period ranged from a low of 28.0° F in January to a high of 75.8 ° F in July. Spring and early summer rains usually exceed winter precipitation. (Sturm and Gilbert, 1978).

1.5 Ecological Survey

A desktop ecological survey was completed by Fluor Daniel GTI personnel. The nearest body of surface water is Little Eagle Creek which flows across the southern boundary of the property. The National Wetlands Inventory Map was obtained for the Indianapolis West Quadrangle (USDI, 1990). These maps are compiled using high altitude aerial photographs and therefore, have a margin of error. The wetlands map identifies Little Eagle Creek as riverain, lower perennial, unconsolidated bottom, and permanently flooded. This area had not been field examined at the time the map was printed.

A letter regarding the site from Mr. David Hudak of the United States Fish and Wildlife Service stated that the area is located within the range of the Federally endangered Indiana bat and peregrine falcon, and Federally threatened bald eagle.

"The Indiana bat uses woodlands during the summer when maternity colonies utilize trees with loose bark for nesting. These bats forage primarily over wooded stream corridors, although they have been collected in grazed woodlots, mature deciduous forests, and pastures with trees. A survey done in 1993 by our office found Indiana bats in the northeast section of Marion County."

"Peregrin falcon habitat is usually described as open country along large rivers, lakes, and coastlines. High cliffs or bluffs are often used as nest sites, however, breeding is also presently occurring on high buildings, bridges, and other man-made structures in cities". None of these features appear to be present in the study area.

"Eagles nest in close proximity to lakes, rivers, and reservoirs. They construct their nests near habitat ecotones, such as lakeshores, rivers, and timber management areas." The site does not appear to be in close proximity to this habitat.

1.6 Site History and Previous Investigations

Two environmental investigations were completed at this property by Engineering Science, Inc. (ESI) in 1992. The initial investigation, entitled *Phase I Information Review Report for General Motors Corporation Allison Gas Turbine Division*, was completed by ESI in July of 1992. This assessment involved no intrusive exploration of environmental conditions. The Phase I assessment identified the following potential areas of environmental concern:

- two reported releases (100 gallons of quench oil in the southwest corner of the property and an unknown amount of hydraulic fluid in the southwest courtyard);
- possible waste burial area at western end of property; and
- possible area of dumping near the northwest corner of the plant.

The above ground storage tanks were reported to be in good condition. The Phase I identified the Plant 10 site as a potential area of concern (PAOC). The report included a recommendation to install three monitoring wells and one soil boring.

An intrusive follow-up assessment of the areas of environmental concern identified during the Phase I assessment was completed by ESI in November of 1993. Methods and results of this additional investigation were reported in a document titled *Phase II Site Assessment Final Report for General Motors Corporation Allison Gas Turbine Division* dated November 19, 1993. During the initial phase of work, three monitoring wells (MW-132, MW-133, and MW-135) were installed and one soil boring (SB-134) was advanced at the site. A soil gas survey was completed on the west side of the property during this investigation. During the second phase of this investigation four monitoring wells (MW-145 through MW-148) were installed and two soil borings (SB-149 and SB-150) were advanced on-site.

Results of this investigation identified trichloroethene (TCE), vinyl chloride (VC), 1,2-dichloroethene (1,2-DCE), tetrachloroethene (PCE), toluene, and methylene chloride in the soil on-site. Compounds most frequently detected included TCE, 1,2-DCE, and VC. Analytical results for the soil sampling are presented in Table 1. The west side of the site was confirmed as a PAOC during the Phase II investigation, however the source was unknown.

O'Brien and Gere Engineers, Inc. (OBG) conducted a Buyer Environmental Assessment for Plant 10 in May, 1994. They advanced six soil borings (SB-10-1 through SB-10-5 and OBG-10-1) and installed one monitoring well MW-10-1 in soil boring OBG-10-1. Surface samples collected included two surface soil samples near an area containing brake pad pieces, two brake pad samples for asbestos testing, and two sludge samples from the sumps located south of the building. These sumps have since been removed. A total of six subsurface soil samples and three groundwater samples were also collected. VOC and metals analytical results for the subsurface soil sampling are presented in Tables 1 and 1B, respectively.

2.0 PHASE III FIELD INVESTIGATION PROCEDURES

Fluor Daniel GTI conducted an expanded subsurface investigation at this site in July 1995, September 1995, and February 1997. The purpose of the investigation was to further characterize the site hydrogeology, to delineate the extent and magnitude of the VOC occurrence in soil and groundwater, and to investigate metals occurrence in surface soil.

2.1 Health and Safety Plan

Before implementation of field work, a site specific Health and Safety Plan was prepared by Fluor Daniel GTI to comply with the OSHA Standard, "Hazardous Waste Operations and Emergency Response," (29 CFR 1910.120) and state and local procedures. Fluor Daniel GTI personnel who performed site work are certified as completing a 40 hour OSHA training course for hazardous waste activities. Additionally, employees have completed an annual eight hour refresher course. Copies of all certifications are kept on

file with the Fluor Daniel GTI, Inc. corporate office of Health and Safety and with the employee's Fluor Daniel GTI branch office.

2.2 Monitoring Well Installation

Fourteen monitoring wells were installed on and off-site as part of this investigation. Well locations are provided on Figure 2. Monitoring wells MW-150 through MW-154 and MW-200 through MW-202 were installed during the time period of June 27 through July 11, 1995 by subcontractors Haskett Drilling and Earth Exploration, Inc. with Fluor Daniel GTI providing technical environmental assistance. Additional subsurface investigations included the installation of monitoring wells MW-155, MW-156 on September 5 and 6, 1995; and the installation of monitoring wells MW-157, MW-158, MW-301, and MW-302 on January 22 through January 31, 1997. The wells were installed with completion depths ranging from 19 to 55 feet below grade (bg) utilizing truck and all terrain vehicle (ATV) mounted hollow-stem auger drill rigs. Wells MW-150 through MW-158 were installed to further delineate (laterally) VOCs in the groundwater both on and off-site. Double cased wells MW-200, MW-202, and MW-302 were installed to vertically delineate VOCs in the groundwater to the southwest and southeast of the facility. MW-201 and MW-301were installed off-site to the southeast to vertically delineate VOC occurrence in that direction. Well locations are shown on Figure 2.

Soil samples were collected at five foot intervals (from 3 feet below surface to boring terminus) for MW-152, MW-154 through MW-158, MW-200 through MW-202, and MW-301 and MW-302. Wells MW-150, MW-151, and MW-153 were installed as part of well clusters where soil samples were collected during the installation of the other wells of the cluster. During advancement of the borings, soil samples were collected by advancing hollow-stem augers and driving a 1.25-inch diameter, 2 foot long split-spoon sampler through the sampling interval. The split spoon sampler was driven into the soil using a 140 pound hammer with a free-fall of approximately 30 inches in accordance with ASTM standards. The number of blows required to advance the split spoon in 6-inch increments were recorded on the boring log (Appendix C). Soils encountered during drilling were logged by a geologist with respect to grain size, moisture content, density, and color using the Unified Soil Classification System (USCS).

Each soil sample was separated into two representative portions and placed in plastic zippered bags. Any organic vapors present in the sample were allowed to equilibrate in one of the tightly sealed bags for approximately 10-15 minutes. The organic vapor concentration in the headspace of the container was then measured using a photo-ionization detector (PID) with a 10.2 eV lamp or a flame ionization detector (FID). The second bag was kept on ice pending packing in glass jars for laboratory analysis. Soil samples from the location of highest PID/FID response and from the bottom of each boring or from the zone above the water table were submitted to GTEL Environmental Laboratories, Inc (GTEL) of Wichita, Kansas for VOC analysis using EPA Method 8240.

All sampling equipment was decontaminated after each boring by washing with a laboratory grade detergent solution and rinsing with water. Augers were cleaned with pressurized steam after each use. All decontamination fluids were collected, placed in drums, labeled and stored on the site for disposal by the owner.

The monitoring wells MW-150 through MW-158 were completed to depths ranging from 19 feet to 29 feet bg and were constructed of two-inch diameter, schedule 40 PVC flush-threaded casing, with 0.020-inch machine slotted schedule 40 PVC screen. The annular space around each well was backfilled with clean silica sand to approximately 1 foot above the top of the screen above which was placed a bentonite seal. The wells were completed with a concrete cap to surface grade and either a flush mounted well box or a stand pipe protective cover. A locking cap was placed on each wellhead. Well construction details are included with the drilling logs in Appendix C.

The deep wells (MW-200 through MW-202) were completed to depths ranging from 35 feet to 50 feet bg. These monitoring wells were installed in accordance with Section 3.3.5 of the Fluor Daniel GTI work plan dated June 20, 1995. Since the clay unit was less than 10 feet thick at MW-200, the well was set at 50 feet bg. Since the clay was greater than 10 feet at the other two locations, MW-201 and MW-202 were set within the clay unit itself. Wells MW-301 and MW-302 were later installed near MW-201 and MW-202, respectively, to intercept the lower sand unit. Well MW-301 was set within the lower sand unit, however, this unit was not present in the vicinity of MW-302. The well screen of MW-302 was set approximately 10 to 20 feet below MW-202 and its screen intercepts an approximately 0.5 feet sand layer. The wells were constructed of two-inch diameter, schedule 40 PVC flush-threaded casing, with 0.020-inch machine slotted schedule 40 PVC screen. These wells were double cased to 25 feet with ten-inch diameter, schedule 40 PVC flush-threaded casing. The outer casing was set with a half foot of bentonite seal at the bottom and a bentonite/portland grout to approximately 6 feet bg. This was allowed to set up for approximately 48 hours. The annular space around each inner well was backfilled with clean silica sand to approximately 1 foot above the top of the screen above which was placed a two foot bentonite seal. The wells were completed with bentonite/portland grout and a concrete cap to surface grade and either a flush mounted well box (MW-200, MW-201, and MW-301) or a stand pipe protective cover (MW-202 and MW-302).

2.3 Hydropunch and Geoprobe Sampling

One Hydropunch boring (HP-1) was advanced on September 6, 1995 and six Geoprobe borings (GP-1 through GP-6) were advanced on December 19, 1996 by Earth Exploration, Inc. with Fluor Daniel GTI providing technical environmental assistance. The Hydropunch was advanced to a total depth of approximately 7 feet, and a water sample was collected before the boring was backfilled. Geoprobe borings were advanced to a total depth of 12 feet bg utilizing a truck mounted Geoprobe rig. The Geoprobe borings were backfilled with bentonite after sample collection. Geoprobes GP-1 through GP-6, and Hydropunch HP-1 were installed to further delineate (laterally) VOCs in the groundwater both on and off-site. Surface soil samples were also collected from the Geoprobe borings for metals analysis. Geoprobe and Hydropunch locations are shown on Figure 2.

Soil samples were collected at five foot intervals (from 3 feet below surface to boring terminus) for HP-1 and GP-1 through GP-6. HP-1 was sampled in the same manner as the monitoring wells. Soil samples from the Geoprobe borings were collected by hydraulically driving a 1.25-inch diameter, piston-type sampler to the desired sampling interval. The piston within the sampler was released and the plastic-lined sampler was advanced through the sampling interval.

Samples were collected and screened in the field using the same methods utilized for the monitoring well samples. In addition to EPA Method 8240, samples from the Geoprobe borings were also analyzed for priority pollutant metals by appropriate EPA 6000/7000 series method.

2.4 Stream Gauge Installation/Measurements

On February 24, 1997, two stream gauges were attached to concrete bridge supports along Little Eagle Creek in order to correlate the creek level with the depth to water in the monitoring wells. One gauge (SG-1) was attached to a bridge support beneath Holt Road, west (upstream) of the site. The second gauge (SG-2) was attached to an abandoned support near the end of Olin Avenue, east (downstream) of the site. SG-1 was attached with an adhesive and SG-2 was attached with screws. Fluor Daniel GTI personnel surveyed the elevation of the tops of the gauges relative to nearby monitoring wells. The stream levels were read off of the stream gauges on February 26, 1997. At this time a partial gauging was done on the wells on site in order to correlate the water levels in the wells with the stream level.

2.5 Well and Stream Gauge Survey

On July 14-17, 1995, monitoring wells MW-150 through MW-154 and MW-200 through MW-202 were surveyed for top of casing (TOC) elevation by Fluor Daniel GTI personnel. TOC elevations of wells MW-155 and MW-156 were surveyed on September 11, 1995, and those of wells MW-157, MW-158, MW-301,

and MW-302 were surveyed on February 4, 1997. The stream gauges were surveyed in on February 26, 1997 by surveying the point on the top of the bridge/support directly above the gauge and measuring the distance to the top of the gauge. Well and stream gauge elevations were measured relative to pre-existing monitoring wells with known elevations using an engineers level. Well TOC elevations are presented in Table 2.

2.6 Rising Head Permeability Tests

Rising-head permeability tests were performed in nine monitoring wells to evaluate the hydraulic characteristics of the shallow and deep aquifers and the inter-lying clay. The rising-head permeability tests involved the rapid removal of a volume of water to lower the level of the water below that measured at static conditions. The rate at which the water level returned to static conditions was then observed by periodically measuring the water level in the test well and recording the elapsed time since the removal of the slug. The tests in the wells screened in the sand aquifers were conducted utilizing a Hermit 2000 data logger with a pressure transducer to measure the rising head. The wells screened within the clay unit were tested by removing a slug of water with a bailer and measuring the rising head utilizing an interface probe (IP). This method was used in the clay unit based on the slow rate of water recovery in the wells.

The rising-head permeability tests were conducted in wells MW-150, MW-151, MW-153, MW-154, MW-200 through MW-202, MW-301, and MW-302 on February 24, 1997. The static water level in each of the selected test wells was measured and recorded prior to initiation of the tests. A 1.25 inch by 5.5 foot long sand-filled PVC slug was submerged below the static water level (SWL) in the sand aquifer wells to displace a volume of water. The water level was then allowed to return to static conditions. Once the water level returned to the original depth, the slug was quickly removed. Following removal of the slug, the water level in the test well was periodically measured utilizing the Hermit 2000 data logger until it had recovered to at least 90% of the static level or until a one-hour monitoring interval had elapsed. The wells screened within the clay unit were tested by removing a slug of water from the well using a bailer and periodically measuring the depth to water using an IP for about 4 to 6 hours.

2.7 Groundwater Monitoring and Sampling

On July 14-17, 1995, September 11, 1995, and February 5-6, 1997, and February 26, 1997 groundwater levels in the monitoring wells were gauged using an electronic interface probe. This probe is capable of measuring the depth to water to within 0.01 feet. The depths to groundwater were used in conjunction with the TOC elevations to calculate the groundwater elevation at each location. The interface probe was thoroughly cleaned with a laboratory grade detergent and water solution, and rinsed with distilled water between each use. Monitoring well MW-133 was not gauged during the July 1995 visit since the broken well box made it appear the well was destroyed. Further investigation showed the integrity of the well had

not been breached and it was gauged during the September 1995 monitoring event. Monitoring well MW-150 was not gauged since it had been developed shortly prior to the sampling event and the water level in the well had not reached equilibrium with the formation. Well MW-200 was not gauged during the September visit due to excess bentonite in the well box. The bentonite was removed from the well box prior to the February 1997 event.

Groundwater samples were collected from all existing monitoring wells except MW-133 on July 14 and 17, 1995 for laboratory chemical analysis of VOCs by GTEL using EPA Method 8240. Groundwater samples were collected from the two new wells (MW-155 and MW-156) and MW-133 on September 11, 1995 for laboratory chemical analysis of VOCs by GTEL using EPA Method 8240. Groundwater samples were collected from all existing monitoring wells on February 5 and 6, 1997 for laboratory chemical analysis of VOCs by GTEL using EPA Method 8240. A second groundwater sample was collected from well MW-157 on February 26, 1997 to confirm the presence of TCE and to investigate tentatively identified compounds (TIC) reported during the previous sampling. Before sampling, a minimum of three well volumes of water were purged from each well using a clean disposable PVC bailer or a decontaminated purge pump. A water sample was then retrieved using a clean disposable bailer and carefully transferred from the bailer into 40 milliliter glass vials with zero headspace and preserved with HCL. The vials were then capped and stored on ice. Promptly after collection, all samples were sent by overnight express to GTEL for analysis under proper chain-of-custody procedures. Appropriate trip blanks, equipment blanks, and duplicate samples were also collected for analysis during the July 1995 and initial February 1997 sampling events. The disposable bailers were discarded after use on one well and the purge pump was thoroughly cleaned between sampling events using a laboratory grade detergent and distilled water rinse.

2.8 Stream Flow Measurements/Water Sampling

Stream flow measurements were obtained from three points in Little Eagle Creek on October 4, 1996 and February 10, 1997 utilizing an open channel water flow meter. The points are located upstream (ST-1), downstream (ST-3), and even (ST-2) with the site (Figure 3). Stream flow measurements were obtained by stretching a measuring tape across the creek channel from one bank to the other. Right and left bank measurements were measured using the tape. Water flow and depth were measured at evenly spaced intervals between the banks utilizing an open channel flow meter and a folding ruler or the measuring pole included with the flow meter. Stream water samples were collected from the three points (ST-1 through ST-3), near the mid-point of the channel, at the time of the measurements and sent by overnight courier to GTEL for analysis by EPA Method 8240. A trip blank, equipment blank, and duplicate sample were also collected and sent with the samples for analysis. Sampling equipment was thoroughly cleaned with alconox and a clean water rinse between sampling points.

3.0 PHYSICAL CHARACTERISTICS OF THE SITE

3.1 Geology

The site area is underlain by the Wisconsin Age Undifferentiated Outwash Deposits and Holocene Age alluvium of Little Eagle Creek (Gray, 1989). Subjacent to this unit is the Devonian Age New Albany Shale which in turn is underlain by the Devonian limestones and dolomites of the Muscatatuck Group (Gray, et al, 1987).

Boring logs compiled during the current investigation indicate that the site area is underlain by unconsolidated materials to a depth of at least 65 feet bg. Three geologic cross sections were constructed to illustrate the site subsurface geology. Locations of the cross sections, A-A', B-B', and C-C' are depicted on Figure 5. The cross sections are presented on Figures 5A and 5B. Boring logs and well construction records for the recently installed wells, Geoprobes, and Hydropunch are provided in Appendix C. The logs indicate that the most surficial unit is a discontinuous silt and/or clay layer extending downward to an approximate elevation of 704 feet (10 feet below grade surface(bgs)). This surficial clay/silt layer is underlain by a sand layer with the bottom extent ranging from approximately 681 to 691 feet in elevation (24 to 34 feet bgs). A discontinuous clay/silt layer occurs within this sand layer in the western portion of the site with upper and lower extents at approximately 707 and 698 feet bgs in elevation, respectively. This sand layer is underlain by a silt/clay layer with the upper extent at approximately 691 to 681 feet,in elevation. At it's thinnest known point this clay layer extends from approximately 690 to 682 feet in elevation (8 feet thick) at it's thickest known point this clay extends from 688 to 655 feet in elevation (33 feet thick). Another sand layer (discontinuous) is found beneath this lower clay layer with an upper boundary at approximately 682 feet in elevation and extending to at least approximately 663 feet in elevation (bottom extent of deepest boring). This sand layer was seen only in borings MW-200 and MW-301. A very thin (< 1 foot) sand seam was noted in MW-302 at an approximate elevation of 662 feet bgs.

3.2 Hydrogeology

According to Meyer, et al, (1975) the aquifer system in Marion County consists of an underlying limestone aquifer, an unconfined glacial outwash aquifer, and a system of three discontinuous, confined sand and gravel aquifers (upper, middle, and lower). The upper confined aquifer does not exist west of the White

River (ie: the site location). These aquifers range in thickness from 0 to 40 feet and lie one above the other. They are generally separated from each other by varying thicknesses of silt and clay. The silt and clay layers act as semipervious confining beds (aquitards). Based on maps constructed by Meyer, et al, (1975), the middle and lower confined aquifers appear to exist beneath the Plant 10 site. In this area, the top of the middle confined aquifer (i.e. sand and gravel unit) ranges in elevation from approximately 680 to 700 feet (measured thickness of 7-12 feet) while the top of the lower confined aquifer (i.e. lower sand and gravel unit) ranges in elevation from 660 to approximately 680 feet (measured thickness 17-26 feet).

Monitoring wells MW10-1, MW-132, MW-133, MW-135, MW-145 through MW-148, and MW-150 through MW-158 are assumed to be completed in the middle confined aquifer described by Meyer (1975). Monitoring wells MW-201, MW-202, and MW-302 are assumed to be completed in the clay unit between the middle and lower confined aquifers, while MW-200 and MW-301 are assumed to be completed in the lower confined aquifer. The intermediary clay layer thickens towards the south-southwest (near MW-302) from approximately 8 feet thick to greater than 33 feet thick.

Groundwater occurs locally in the middle confined aquifer at elevations ranging from 698.92 to 703.75 feet based on the three gauging events in 1995 and 1997. Based on the absence of a confining layer, this unit is assumed to be under water table conditions locally. In the intermediary clay layer, groundwater occurs at elevations ranging from 689.10 to 700.68 feet. The groundwater elevation for MW-202 was originally 689.10 feet (July 14, 1995), however, the well had recently been developed and the water level in the well may not have reached equilibrium with the water level in the formation. In the lower confined aquifer, groundwater occurs at elevations ranging from 698.83 to 701.00 feet. Well gauging data are provided in Table 2.

Groundwater elevation data for wells completed in the middle confined aquifer indicate flow across the property generally towards Big Eagle Creek to the south. Figures 6A, 6B, and 6C are potentiometric surface maps for the July 14-17, 1995, September 11, 1995, and February 5-6, 1997 gauging events (respectively). Comparison of these three maps shows a similarity in flow pattern across the site. Insufficient well coverage is available to determine groundwater flow direction in the lower confined aquifer. Based on the relative location of (big) Eagle Creek groundwater flow in this unit is likely to the south.

A comparison of well and creek gauging data from February 26, 1997 indicated that groundwater flow was directed toward the creek (as above) and based on relative water elevations shallow groundwater was discharging into the creek.

Three well clusters are present in the study area. One cluster (A), composed of MW-153, MW-202, and MW-302, is located in the western portion of the site. A second cluster (B), composed of MW-150 and

MW-200, is located east of the plant building. A third cluster (C), composed of wells MW-151, MW-201, and MW-301, is located off-site to the southeast. Clusters A and C have wells completed in all three of the previously discussed units. Cluster B has wells in the middle confined and lower confined aquifers. A comparison of groundwater elevations in the three well clusters indicated a downward gradient in the western portion of the site and east of the plant. An upward gradient was observed offsite to the southeast.

Rising head permeability tests were conducted on wells completed in the middle confined (water table) aquifer, intermediary clay layer, and lower confined aquifer. To evaluate the hydraulic conductivity of the materials tested, the analytical method presented in Bouwer and Rice (1976) for unconfined aquifers was used. In this method, time versus water level data are plotted as semilog (time on linear x-axis and water level on log y-axis). A straight line is fit to the linear portion of the curve. Typically, the late-time data is nonlinear and is not used. Appendix D contains the Bouwer and Rice analytical solution, table of analysis parameters, method plots with best-fit lines, and the raw field data.

Table 3 summarizes the results of the slug test analysis used to estimate hydraulic conductivity of the shallow sandy aquifer, the intermediate silty-clay aquitard, and the lower sandy aquifer. Good repeatability was found for repeat tests within a single well as shown for MW-151, MW-154, MW-200, and MW-301.

Core samples were collected during installation of MW-151 and MW-301. A falling head permeability test was conducted on the (repacked) core samples to estimate the material hydraulic conductivity. This test measures the vertical hydraulic conductivity of the sample. The most reliable results are obtained from intact core samples. Less reliable results are obtained when the samples are a repacked. Cohesive soils (high clay content) generally remain intact while noncohesive soils (low clay content) typically do not remain intact and require repacking prior to testing. These test results are not used in calculating the average horizontal K value for each unit.

Vertical to horizontal K ratios generally range from 1:2 to 1:100 (Walton, 1988). The ratios 1:2, 1:10, 1:100 are considered representative of low, medium, and high degrees of anisotropy, respectively (Walton, 1988). Based on MW-151 testing, the ratio for the shallow materials is about 1:30 which is considered a medium degree of anisotropy. The ratio from MW-301 tests suggest no difference between vertical and horizontal K of the lower sand.

As shown in Table 4, average K values are found to be 137 feet/day for the upper water table aquifer, 0.012 feet/day for the middle silt-clay aquitard, and 9.1 feet/day for the lower confined/semiconfined aquifer. The lower aquifer at the site most likely is under confined to semi-confined conditions. Slug test results for MW-302 were not used to calculate the average aquitard

K because the well is completed across a thin sand seam that may not be representative of the aquitard as viewed on an average or site-wide scale.

4.0 RESULTS

4.1 Soil Analytical Results

4.1.1 Surface Soils (0-2 feet)

Detectable results of field screening of soils with a PID/FID ranged from 1.3 parts per million by volume (ppmv) in GP-4 to 4.6 ppmv in GP-1 and GP-2. Soil vapor headspace readings are summarized in Table 5.

Surface soils were collected during the advancement of Geoprobe borings GP-1 through GP-6 for analysis of priority pollutant metals. Chromium, copper, lead, nickel, and zinc were found in all six samples. Chromium concentrations ranged from 5.5 milligrams per kilograms (mg/kg) in GP-1 to 1,600 mg/kg in GP-2. Copper concentrations ranged from 7.4 mg/kg in GP-5 to 510 mg/kg in GP-2. Lead concentrations ranged from 8.6 mg/kg in GP-6 to 940 mg/kg in GP-2. Nickel concentrations ranged from 7.7 mg/kg in GP-1 to 28 mg/kg in GP-2. Zinc concentrations ranged from 36 mg/kg in GP-5 to 880 mg/kg in GP-2. Beryllium was found only in GP-3 at a concentration of 0.61 mg/kg and Cadmium was found only in GP-2 at a concentration of 4.1 mg/kg.

4.1.2 Vadose Zone (2-10 feet)

Detectable results of field screening of soils with a PID/FID ranged from 0.4 ppmv in MW-156 (3-5 feet) to greater than 1000 ppmv in MW-158 (8-10 feet). Soil vapor headspace readings are summarized in Table 5.

Laboratory analytical results for soil samples collected during this investigation indicated the presence of VOCs in 8 of the 11 vadose samples collected. A total of five VOCs were detected in the samples and included trichloroethene (TCE), vinyl chloride (VC), {cis-} and {trans} 1,2-dichloroethene ({cis} and {trans} 1,2-DCE), and tetrachloroethene (PCE). None of the samples contained all five compounds. The most frequently detected compounds were TCE (5 out of 11 samples) and {cis} 1,2-DCE (3 out of 11 samples). 1,2-DCE is a degradation product of TCE and its occurrence may be attributable to the decomposition of TCE over time.

Detectable TCE concentrations ranged from 41.0 micrograms per kilogram(ug/kg) in GP-6 (5-7 feet) to 12,000 ug/kg in GP-1 (5-7 feet). TCE concentrations were below detection limits in MW-154 (8-10 feet),

MW-157 (3-5 feet), MW-158 (8-10 feet), GP-2 (5-7 feet), GP-3 (5-7 feet), and HP-1 (3-5 feet). Detectable concentrations of cis-1,2-DCE ranged from 40 ug/kg in HP-1 (3-5 feet) to 2,700 ug/kg in GP-1 (5-7 feet). Cis-1,2-DCE was below detection limits in MW-152 (8-10 feet), MW-154 (8-10 feet), MW-157 (3-5 feet), MW-158 (8-10 feet), and GP-3 through GP-6 (5-7 feet). VC, another degradation product of TCE, was detected only in GP-1 (5-7 feet) and GP-3 (5-7 feet) at concentrations of 40 ug/kg and 12 ug/kg, respectively. {trans} 1,2 DCE was detected only in GP-1 (5-7 feet) at a concentration of 25 ug/kg, while PCE was detected only in HP-1 (3-5 feet) at a concentration of 17 ug/kg. Soil analytical results for compounds detected in wells and borings installed by Fluor Daniel GTI are summarized in Table 6. Laboratory analytical reports are provided in Appendix E. Analytical results for TCE, 1,2-DCE, and VC in the soil vadose zone for these borings and those advanced by previous consultants are provided on Figure 7.

4.1.3 Saturated Zone (>10 feet)

Detectable results of field screening of soils with a PID/FID ranged from 0.2 parts per million by volume (ppmv) in MW-200 (38-40 feet) and MW-202 (23-25 feet) to 540 ppmv in MW-302 (48-50 feet). Soil vapor headspace readings are summarized in Table 5.

Laboratory analytical results for soil samples collected during this investigation indicated the presence of VOCs in 6 of the 13 saturated zone samples collected. The five VOCs detected in the vadose samples were also detected in the saturated zone samples. Again, none of the samples contained all five compounds. The most frequently detected compounds were TCE (5 out of 13 samples) and {cis} 1,2-DCE (4 out of 13 samples).

Detectable TCE concentrations ranged from 6.8 ug/kg in MW-202 (33-35 feet) to 8,300 ug/kg in MW-202 (13-15 feet). TCE concentrations were below detection limits in MW-152 (18-20 feet), MW-154 (18-20 feet), MW-155 (28-30 feet), MW-200 (48-50 feet), MW-201 (both samples), and MW-302 (both samples). Detectable concentrations of cis-1,2-DCE ranged from 33 ug/kg in MW-200 (13-15 feet) to 3,500 ug/kg in MW-155 (13-15 feet). Cis-1,2-DCE was below detection limits in MW-152 (18-20 feet), MW-154 (18-20 feet), MW-155 (28-30 feet), MW-156 (18-20), MW-200 (48-50 feet), MW-201 (38-40 feet), MW-202 (33-35 feet), and MW-302 (both samples). VC, another degradation product of TCE, was detected only in MW-155 (13-15 feet) and MW-202 (13-15 feet) at concentrations of 60 ug/kg and 24 ug/kg, respectively. {trans} 1,2 DCE was detected only in MW-201 (18-20 feet) at a concentration of 11 ug/kg. PCE was detected in MW-156 (18-20 feet) and MW-200 (13-15 feet) at concentrations of 14 ug/kg and 18 ug/kg, respectively. Soil analytical results for compounds detected in wells and borings installed by Fluor Daniel GTI are summarized in Table 6. Laboratory analytical reports are provided in Appendix E. Available data indicates that concentrations of 1,2-DCE, TCE, PCE, and VC all decrease with depth.

4.2 Groundwater Analytical Results

4.2.1 Monitoring Wells and Hydropunch

Laboratory analytical results for groundwater samples collected from monitoring wells and the Hydropunch during the current investigation indicated the presence of VOCs in 28 of the 41 samples collected. A total of six VOCs were detected in the groundwater samples and included TCE, {cis} and {trans} 1,2-DCE, VC, acetone, and 1,1-dichloroethane. Acetone was detected in one sample only at a concentration near the detection limit. Since acetone is a common laboratory contaminant and was detected in one sample only at a low concentration, it was not considered to be present in groundwater. None of the samples contained all of the detected VOCs compounds. As was the case in soil, the most frequently detected compounds were TCE (22 out of 41 samples) and {cis} 1,2-DCE (21 out of 41 samples). VC was detected in 7 of the 41 samples and only in MW-155 (3,400 ug/L) during the February 5-6, 1997 sampling event. The compounds 1,1-dichloroethane and {trans} 1,2-DCE were not detected in any samples during the February, 1997 sampling event.

No VOCs were detected above the detection limit in MW-135, MW-154, MW-158, MW-200 through MW-202, MW-301, the trip blank, and the equipment blank. Groundwater samples collected from the remainder of the wells all contained detectable VOC levels. Detectable TCE concentrations ranged from 5.4 ug/L in groundwater collected from well MW-153 to 15,000 ug/L in well MW-132. Detectable {cis} 1,2-DCE concentrations ranged from 5.3 ug/L in groundwater collected from MW-152 to 65,000 ug/L in MW-132. Concentrations of {trans} 1,2 DCE ranged from 5.9 ug/L in MW10-1 to 1,400 ug/L in MW-148. Detectable VC concentrations ranged from 12 ug/L in MW-145 to 3,400 ug/L in MW-155

Data collected from the well clusters indicate that VOCs concentrations in groundwater decrease with depth. Only MW-302 contained a detectable VOCs concentration. MW-302 contained cis-1,2-DCE at a concentration of 8.2 ug/L. Groundwater analytical results for compounds detected during the current investigation are summarized in Table 7. Analytical results for TCE, 1,2-DCE, and VC in groundwater for the monitoring wells are provided on Figures 8A and 8B. Laboratory groundwater analytical reports are presented in Appendix F.

Isoconcentration maps were constructed for TCE, 1,2-DCE, and VC concentrations in groundwater using the February, 1997 data (Figures 9, 10, and 11). These figures show two areas of elevated VOCs at Plant 10. The two areas are: 1) west of the building in the vicinity of MW-132 and; 2) southeast of the building in the vicinity of MW10-1.

Two groundwater samples were collected from MW-157 in February 1997. Both contained a detectable concentration of TCE. Levels of 60 ug/L and 100 ug/L were detected in the well on February 6 and

February 26, respectively. Both samples contained a detectable concentration of undetermined aliphatic petroleum hydrocarbons. The type and quantity of the hydrocarbons could not be determined. The source appears to be localized to the vicinity of the well and not the site.

Groundwater data collected during previous investigations were compared to recent data to evaluate trends in dissolved VOCs concentrations. Historical dissolved VOCs data are provided in Table 7. In general, most of the wells did not exhibit major changes in dissolved VOCs concentrations with time. Dissolved VOCs concentrations did increase in wells MW-132 and MW155. Detected concentrations decreased in wells MW-148, MW-153, and MW-156. Wells MW-132 and MW155 are located in the western potential source area. Well MW-148 is located downgradient of MW-132. MW-153 is located in the well cluster located southwest of the building and MW-156 is located offsite to the southeast.

4.2.2 Little Eagle Creek Surface Water Sampling

Surface water samples were collected from Little Eagle Creek at ST-1, ST-2, and ST-3 on October 4, 1996 and February 10, 1997 for analysis of VOCs by EPA Method 8240. Two of the samples collected in October 1996 (midstream and downstream) contained a detectable VOC concentration. The midstream sample (ST-2) contained 17 ug/L cis-1,2-DCE and the downstream sample (ST-3) contained 14 ug/L cis-1,2-DCE. Both values are below the Federal M.C.L. for drinking water of 70 ug/L. None of the samples collected in February 1997 contained a detectable VOC concentration. A trip blank analyzed for the October 1996 sampling event contained 5 ug/L methylene chloride. The method blank for the sampling event contained 5.9 ug/L methylene chloride. A concentration of 8.3 ug/L methylene chloride was detected in an equipment blank for the February 1997 sampling event. The laboratory report indicated that methylene chloride is a common laboratory contaminant. Analytical results for TCE, 1,2-DCE, and VC in the surface water from the creek are provided on Figure 12. Laboratory analytical reports for Little Eagle Creek are presented on Table 7B and in Appendix B.

4.3 Aquifer-Stream Interaction

4.3.1 Stream Flow

To estimate stream flow in Little Eagle Creek in the vicinity of the site, stream velocity and flow depth were measured on October 4, 1996 and February 10, 1997. An upstream (ST-1), midstream (ST-2), and downstream (ST-3) location were selected as shown on Figure 3. At each location, stream depth and velocity were recorded every 2 feet in a direction perpendicular to flow, from the north bank to the south bank. The raw field data are summarized in Appendix G. Total stream flow at each location was calculated using a midpoint method. Discharge in cubic feet per second (cfs) for each 2-foot section of the stream is summed up to provide the total stream flow. These calculations are shown in Appendix G.

Calculated stream flow is summarized in Table 8. Stream flow on October 4, 1996 was too low and the flow area too wide, so flow velocity could not be accurately measured at the upstream and downstream locations. As a result, these data were not used in any calculations. At midstream, flow depth was adequate and stream flow was calculated as 7.98 or 8 cfs. Steam flow on February 10, 1997 was sufficient to measure velocity at all locations. Stream flow was calculated as 20.88 cfs, 23.77 cfs, and 23.58 cfs for upstream, midstream, and downstream locations, respectively. This indicates the stream is gaining volume as it flows past the site.

The nearest gauging station is located about 1.2 miles upstream of the site at the West 16th Street bridge. Flow data at this location from 1965 to 1995 (Stewart, 1983) are summarized for October and February on Table 8. The data suggest that, on average, the stream flow is lower (11.1 cfs) in October compared to February (30.4 cfs). Site specific stream flow data supports this observation. This suggests that the gaging station can be used to describe general stream flow trends at the site but more site-specific data would be needed before actual gauging station discharge values could be used quantitatively.

4.3.2 Chemical Mass Loading to Little Eagle Creek

In the western portion of the site, groundwater from the shallow water table aquifer discharges to Little Eagle Creek. The groundwater concentration just before entering the stream is based on a temporary well point (HP-1) that was installed near the streambank (see Figure 2). Groundwater from HP-1, as sampled and analyzed on October 4, 1996, was found to contain 3,900 ug/L of cis-1,2-DCE, 430 ug/L of TCE, and 500 ug/L of VC.

Stream samples were collected on October 4, 1996 and February 10, 1997 (Figure 12) at locations upstream, midstream, and downstream of the site. Two of the samples collected in October 1996 (midstream and downstream) contained a detectable VOCs concentration. The midstream sample (ST-2) contained 17 ug/L cis-1,2-DCE and the downstream sample (ST-3) contained 14 ug /L cis-1,2-DCE. Both values are below the Federal MCL for drinking water of 70 ug/L. None of the samples collected in February 1997 contained a detectable VOCs concentration. A trip blank analyzed for the October 1996 sampling event contained 5 ug/L methylene chloride. The method blank for the sampling event contained 5.9 ug/L methylene chloride. A concentration of 8.3 ug/L methylene chloride was detected in an equipment blank for the February 1997 sampling event. The laboratory report indicated that methylene chloride is a common laboratory contaminant.

Site-specific hydrogeologic and chemical data are used to develop a conceptual model of aquifer-stream interaction so that chemical mass loading to the stream can be estimated. The conceptual model consists of a shallow sandy water table aquifer in good communication with Little Eagle Creek, a gaining stream at the site. Since the aquifer is relatively thin (about 18 feet), all of the

shallow groundwater is assumed to discharge to the stream as illustrated in Figure 13. The creek is a local discharge area in contrast with Eagle Creek, located further to the southwest, which is the likely discharge area for the deeper aquifers at the site.

The water table contour maps shown in Figures 6A, 6B, and 6C suggest a gaining stream at the site with the shallow aquifer contributing to stream baseflow. Baseflow is the relatively constant (long-term) contribution of groundwater to streamflow. Storm runoff accounts for the large fluctuations (short-term) in streamflow that occur above the baseflow. Average aquifer thickness, based on well logs, is about 18 feet. With such a limited thickness, it is not unreasonable to assume that all of the shallow aquifer discharges to the stream.

Assumptions must be developed for the groundwater chemical concentration as it enters the stream and the dimensions of the chemical loading area (thickness and width). HP-1 was screened in the upper few feet of the aquifer and is conservatively assumed to represent the concentration of groundwater entering the stream. In reality, the concentrations along the chemical loading width would be expected to diminish in directions away from HP-1. If the chemical plume maps and groundwater contour maps are superimposed, flowlines can be drawn to show the width of streambank where chemical loading occurs is about 360 feet, as shown in Figure 14. The chemical loading width is taken as the average aquifer thickness of about 18 feet. Given the relatively thin aquifer thickness and that sources are located up to 300 feet or more upgradient, concentrations are assumed to be distributed throughout the aquifer thickness.

The final assumption concerns mixing in the stream. It is assumed that complete mixing occurs as the aquifer discharges to the stream. Given the small width (about 35 feet) of the stream and limited depth (<0.50 feet on October 4, 1996), this assumption is reasonable.

The following form of Darcy's law (Todd, 1980) is used to calculate the discharge from the shallow water table aquifer into the stream through the chemical discharge area.

$$Q = K I A$$

where Q = volumetric flux (ft^3/d)
K = hydraulic conductivity (ft/d)
I = hydraulic gradient (ft/ft)
$A = W \times D$ = chemical loading area (ft^2/d)

where W = chemical loading area width (ft)
D = chemical loading area thickness (ft)

The following values were selected:

K = 137 ft/d	Average K from slug test analysis for the shallow aquifer
I = 0.005	Calculated directly from site water level data
W = 360 ft	Based on plume and groundwater contour maps
D = 18 ft	Based on average aquifer thickness from well logs

Groundwater discharge to the stream is calculated as 1.4×10^{-4} cfs per foot of streambank or 0.05 cfs along the chemical loading area. Assuming that the discharging groundwater contains the chemical concentrations observed in HP-1, the resulting stream concentration can be estimated as follows (modified from Todd, 1989):

$$Qt\ Ct = Qs\ Cs + Qa\ Ca$$

where Qt = combined flow (cfs)
Ct = combined concentration (ug/L)
Qs = stream flow (cfs)
Cs = stream concentration (ug/L)
Qa = aquifer flow (cfs)
Ca = aquifer concentration (ug/L)

Solving for the combined concentration Ct yields:

$$Ct = (Qs\ Cs + Qa\ Ca) / Qt$$

Input data to this equation are as follows:

Qs = 8 cfs (observed)
Cs = 0.0 ug/L (observed)
Qa = 0.050 cfs (calculated)
Ca = 3,900 ug/L cis-1,2-DCE, 500 ug/L VC, and 430 ug/L TCE (observed)
Qt = Qa + Qs (calculated)

Assuming only the western plume is loading to the stream, conservative estimates of stream concentrations at low flow conditions are 25 ug/L, 3.2 ug/L, and 2.7 ug/L for cis-1,2-DCE, TCE, and VC, respectively. All values are below the MCLs for drinking water supplies. Estimated stream concentrations during higher flow (February) are significantly below the detection limit of 5 ug/L for cis-1,2-DCE, TCE, and VC.

aquifer-stream interaction modeling were considered for evaluations of the surface waters. The two surface water sampling events were both recent and only three months apart to represent low and high flow stream conditions. For the purposes of the risk assessment for the site, it is assumed that the site will remain intact as it currently is (surface cover and on-site building structures), be used as an industrial property in the future, and will continue to use only the municipal water supply for all water uses on site. Deed restrictions may be necessary to ensure future site uses under this assumption. Several other general assumptions were made during this risk assessment. They are as follows:

- Since little on-site and no off-site surface soil data were collected as part of the current or historic data collection efforts and based on the nature of the site-related constituents of interest (COI) being mobile, susceptible to leaching and volatilization, the subsurface soil data were assumed to conservatively represent both surface (0-2 feet) and subsurface (below 2 feet) soil conditions. Soil vapor headspace readings, summarized in Table 5, support the assumption that the upper soil layers did not have the most significant readings. The highest soil vapor readings typically occurred in the interval 13 to 20 feet below surface, which is within the saturated soil zone. Two surface soil samples were collected by a previous consultant (O'Brien & Gere Engineers, 1994) and reported as having extremely low level concentrations of one site-related COI in one surface soil sample. It should be noted that although the analytical results of these two samples support the assumption that the subsurface soils represent worst-case surface soil conditions, they were collected in a relatively unimpacted area in the western half of the northern side of the plant property.

- COI intake pathways for each examined receptor follow the same pathways as used by IDEM in calculating the Tier II Cleanup Goals (IDEM, 1996). IDEM regulations (1996) require comparison of soil concentrations to the Maximum Upper Limit values for chemical classes to be "protective of other potential exposure pathways not evaluated in the calculation of health-based criteria". For VOCs, the total VOCs concentration in soil cannot exceed 1,000 mg/Kg. None of the soil samples collected had total VOCs concentrations exceeding 1,000 mg/Kg. For this risk assessment, other soil potential pathways, such as for dermal contact have been assumed to be subsumed by the soil incidental ingestion pathway risk estimates.

- As described in section 5.3, Domestic and Municipal Well Locations, downgradient wells due south of the facility are not likely to be impacted from the plume identified on site in the upper aquifer in the western portion of the property due to the fact that all indications are that the groundwater in this aquifer discharges to the Little Eagle Creek. Additionally, the nearest downgradient well to the south appears to be approximately one-quarter of a mile downgradient, based on the current well survey. Obviously with mixing and other attenuation factors, not only would the groundwater be unlikely to migrate to this receptor but the concentrations at

downgradient wells south of the site would be much lower than the concentrations immediately off site (which typically do not significantly exceed IDEM residential health-based criteria for groundwater). It is assumed for this assessment that the only receptor to the western plume in the upper aquifer is the Little Eagle Creek.

- Sample HP-1, which is a shallow Hydropunch groundwater sample collected in the previous sampling event a few feet from the Little Eagle Creek shoreline, is assumed to be an anomalous groundwater sample. Comparison of the HP-1 COI concentrations to groundwater sample concentrations from wells immediately upgradient show much lower upgradient concentrations. However, the COI concentrations in HP-1 were used as worst-case conditions for the aquifer-stream interaction modeling to determine whether COI in the upper aquifer are deleteriously impacting Little Eagle Creek. The aquifer-stream interaction discussions are presented in __.

- The soils collected within or under the water table (approximately 10-12 feet bgs) will not be considered as part of the subsurface soil data set for direct contact soil exposures since given the relatively stable depth to groundwater in the area of this site, no realistic scenarios (including commercial or residential construction activities) would normally involve human contact with soils at or below this depth. The soils at or below the water table are considered to be impacted as the result of the impacted groundwater plumes in the same areas, particularly for off-site impacts detected. As evidence of this assumption, in most locations where soil samples were collected just within the water table, the groundwater concentrations are significantly higher than the correlating soil concentrations of the COIs.

- An unregistered private residential well was identified due east of the facility on North Olin Avenue in a door-to-door survey performed by the Marion County Health Department. The residential well was sampled by the county and site-related COI were all nondetect. The groundwater flow from the relatively well-defined plume identified on the southeast portion of the site appears to be directed towards the south-southeast. Therefore, this residential well is assumed not to be a potential receptor for direct contact of this groundwater plume.

- The most current toxicity values for cancer slope factors (CSFs) and reference doses (RfDs) used in the human health risk evaluations were obtained from US EPA sources including references from the Integrated Risk Information System (IRIS) on-line database.

Other assumptions that are specific yet minor in consequence will be presented as they become necessary and applicable.

As stated in Section 5.0, the typical first step in data evaluation under the IDEM three tiered approach is to compare chemicals detected in impacted environmental media to Tier I background levels. However, this comparison was not completed for VOCs because these compounds do not naturally occur in the environment and because there is no evidence that the soil, groundwater, or surface water impact are related to upgradient sources. For the metals results in surface and subsurface soils, a background comparison was possible. The surface and subsurface soil metals results are presented in Tables 6B and 1B, respectively. Since IDEM does not provide background levels for the Tier I evaluations, literature values for the State of Indiana (when available) were utilized from *Elements in North American Soils* (Dragun, 1991). A summary of literature background ranges utilized for Tier I comparisons are presented in Table 9. Comparison of metals concentrations to the Tier I background ranges reveal arsenic, barium, chromium, mercury, and silver subsurface soil results are within expected background. Similarly, beryllium and zinc in surface soil results are within expected background. Therefore, these potential COIs can be removed from further consideration in this risk assessment.

Chemical concentrations reported for subsurface soil and groundwater were compared to IDEM Tier II generic health-based cleanup goals in Sections 5.3.2 and 5.4.2. Tier II health-based cleanup goals are calculated based on human health risks using standard risk assessment exposure assumptions generally following EPA's procedures for calculating preliminary remediation goals (EPA, 1991a). The results of the Tier II Cleanup Goal comparisons were used to focus discussions of the analytical results. These same comparative results will be used below to help screen COIs for the risk assessment. IDEM does not provide health-based cleanup goals for all chemicals for ecological or human exposures for impacted surface waters. In particular, the state's surface water quality criteria (1993) does not have a criterion for the COI cis-1,2-dichloroethene. Therefore, literature or federal screening values were used, as appropriate, for ecological receptors. Standard risk calculations were performed to evaluate whether potential risks exist for residential exposures to impacted surface waters.

5.1.1 Data Gaps

As described in Section 5.1, only limited surface soil data were obtained as part of the historical data collection efforts (O'Brien & Gere, 1994). As stated above, only two surface soil samples were collected in an area found to be relatively unimpacted in subsequent investigations. For this assessment, the subsurface soil conditions have been assumed to be the worst-case surface soil conditions. This is a potential data gap because the true surface soil conditions are uncertain. However, based on the current inactivity of the site, knowledge of the upper soil physical conditions and the soil vapor headspace readings, the assumption that the subsurface soils data represent the worst case of the surface soils appears to be conservative and valid.

Another potential data gap relates to the uncertainty of the removal action of soils impacted by asbestos. Soil particles containing asbestos if at the surface could become airborne as fugitive dust. The O'Brien & Gere report (1994) indicated that certain surface and subsurface soils in areas in the northwestern portion of the property where brake pads were discovered contained bulk asbestos up to 10% by volume. Insufficient documentation exists to determine whether the removal action completely eliminated this potential threat. A site walkover conducted by Fluor Daniel GTI and General Motors personnel on June 10, 1997 revealed the presence of a crushed drum near the surface containing what appeared to be pieces of brake pads. The drum was located near the western wall of the plant building north of the driveway. Further subsurface investigations (i.e. test pits) are planned for the area to determine the magnitude and extent of buried drum and asbestos occurrence in the northwestern portion of the site.

Other potential data gaps include: 1) the lack of sediment data from the Little Eagle Creek which is a possible impacted receptor considering its close proximity to the site and the presence of constituents in the Hydropunch groundwater sample collected near the shoreline and in two of the surface water samples during the low flow sampling event; 2) the lack of complete definition of the areal extent of COIs in groundwater off-site to the southeast (additional monitoring wells are planned to address this data gap); and 3) the lack of additional data collection to identify whether results obtained in HP-1 are anomalous, however, as stated previously, use of data from HP-1 is considered conservative.

Although the lack of sediment quality data have been identified as a potential data gap for this assessment, a qualitative statement regarding the potential hazards of impacted sediments to likely receptors can be made. Based on relatively high water solubilities and low octanol-water partitioning coefficients (K_{ow}), volatile organic chemicals tend to be very mobile in water and tend not to sorb to particulate matter. Based on the fact that the most significant point of exposure to environmental receptors (human and ecological) for potentially impacted sediments would be via the migration of the chemical to the surface water (Little Eagle Creek) and that two samplings of the surface waters have shown relatively minor impact, the sediments are not likely themselves to be of environmental concern. Comparison of the surface water sample data with surface water quality benchmarks for protection of human consumption (Title 327, Article 2, Water Quality Standards) and for ecological receptors (Suter, 1996) has clearly shown minimal potential for adverse effect of surface waters to these potential receptors. Therefore, the sediment quality data gap should not be construed as being of concern.

Additional wells are planned to be installed to address the lack of complete delineation of COI's in the groundwater off-site to the southeast of the site. The wells will be installed south and east of MW-157.

The lack of additional groundwater data from HP-1 is not a concern for the following reasons: data collected from HP-1 may not be representative of VOC concentrations in groundwater in the shallow sand unit at that location. If concentrations are vertically stratified (decline with depth), sample HP-1 would

overestimate the average value since it was collected from near the surface. A sample collected from a well point screened over the entire interval would provide a more representative vertically-averaged value of VOC concentrations. However, the data from HP-1 should represent the worst case and therefore appears to be conservative and valid.

5.1.2 Vadose Zone Soils

A total of 21 historic and current on-site subsurface soil samples from various depths and 3 historic and current off-site subsurface soil samples from various depths were collected at the site in the vadose zone and analyzed for VOCs. This data set serves as the basis for the soil potential exposures assessment in this report. All soil VOCs data for detected constituents are presented in Tables 1 and 6 for historical and current collection efforts, respectively. As described above in Section 5.1, only subsurface soils from above the water table were considered for direct contact exposures in this risk assessment. Historic subsurface soils were analyzed for a variety of chemical parameters including VOCs, semivolatile organics (SVOCs), polychlorinated biphenyls (PCBs), various TPHs, select metals, and asbestos. All of these parameter groups, except for VOCs and metals, were eliminated from current sampling programs due to a lack of positive detections. Current subsurface soil samples were analyzed for VOCs and recent surface geoprobe samples were analyzed for metals as described in Section 5.3. Current and historic soil metals results are presented in Tables 6B and 1B, respectively. In order to appropriately assess human health risks for VOCs and metals impact to site-related soils, COIs that realistically contribute to potential quantitative risks must be selected.

For this assessment, there are four criteria in selecting final COIs. As stated in Section 4.0, all environmental samples were analyzed for a target list of VOCs by Method 8240 and select samples were analyzed for various metals. The final COIs were selected from this list of chemicals. Note that the historic soil VOCs data had results for total-1,2-dichloroethene while the current sample analyses reported results separately for the cis- and trans-1,2-dichloroethene isomers. For consistency, the current analytical data results for cis-and trans-1,2-dichloroethene were summed to make a uniform data set in the risk-based summary tables. Since most of the total-1,2-dichloroethene concentration was contributed by the cis-1,2-dichloroethene isomer, (as can be seen from comparing the cis and trans 1,2-dichloroethene isomer concentrations shown in the original sample results in Tables 1 and 6) all physical and toxicity constants for the total-1,2-dichloroethene results were based on cis-1,2-dichloroethene. Also note that the historic subsurface soil samples that were selected for the metals analysis were analyzed for the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver and the current surface soil samples that were selected for metals analysis were analyzed for the metals beryllium, cadmium, chromium, copper, lead, nickel, and zinc. However, this is not of significant consequence since, as were evident below, all metals results were screened out from evaluation in the risk assessment.

Several of these metals results have already been eliminated from further evaluation since they were within expected background ranges from literature values.

The first criterion used for selecting final COIs was examining whether the compound was site-related. The VOCs methylene chloride was only detected in three on-site soil samples that were all collected and analyzed on the same day at low concentrations. Based on the fact that this VOCs is not related to historical site uses, is a common laboratory contaminant, and the similarly low detected results are indicative of typical GC/MS blank contamination, methylene chloride was removed as a COI.

The second criterion for selecting final COIs is its detection. If a target VOCs or metal is not detected, it should be removed from further consideration. Tables 1 and 6 edited the list of target VOCs to only those that were detected in at least one sample. Frequency and statistical summaries of the VOCs COIs retained thus far for on-site and off-site subsurface soils are presented in Tables 10 and 11, respectively. These summaries present the minimum and maximum detected concentrations, the location of the maximum detected concentration, the frequency of detection, the arithmetic mean, standard deviation, and the 95 percent upper confidence level (UCL) for each vadose zone soil VOCs COI retained for further evaluation. Note that the statistics presented for vinyl chloride in Table 10 do not include the unusually high detection limit value for soil sample SB-132. This value was removed from the soil data set in accordance with the EPA guidance document RAGS (1989a), Section 5.3.2. The original reported sample quantitation limit was 6,300 ug/kg when the maximum detected concentration in sample SB-150 was only 500 ug/kg and the next highest detected value was found in sample GP-1 at 40 ug/kg. Therefore, even the half-detection limit value was more than six times higher than the highest detected concentration. Based on that fact and that vinyl chloride was only detected in three of 21 vadose zone soil samples, this value was not utilized in calculating the arithmetic mean, standard deviation, or 95% UCL value presented in Table 10.

When re-organized into on-site and off-site vadose zone summary tables, the off-site list of COIs removed vinyl chloride, trichloroethene, toluene, and xylenes for lack of any off-site detections. Similarly, when considering only vadose zone on-site soils, the on-site COI toluene is removed for lack of detections. All metals above background were detected in at least one sample.

The third and fourth criteria for this assessment are based on prevalence and whether the compound was detected above the Tier II Cleanup Levels. Normal EPA convention uses a cutoff of five percent as a percentage of detection frequency for assessing whether to retain a COI based on prevalence. Tetrachloroethene and total xylenes were both detected in on-site vadose zone soil samples at a frequency of one in 21 (4.8%). Additionally, neither was detected above its respective Tier II Non-Residential Cleanup Levels. Total-1,2-dichloroethene concentrations in on-site soils were all below its associated Tier II Non-Residential Cleanup Levels and tetrachloroethene and total-1,2-dichloroethene

concentrations in off-site soils were all below its respective Tier II Cleanup Levels. Therefore, based on either or both of these criteria (low prevalences and detections are all below the Tier II Cleanup Levels), these VOCs were removed from the list of final COIs for on- and off-site soil exposures.

Trichloroethene was the most frequently detected VOCs on site (14 of 21 wells). However, even though one single trichloroethene detection in SB-132 exceeded the Tier II Non-Residential cleanup goal, the 95% UCL of the arithmetic mean concentration for trichloroethene in on-site vadose zone soils was below the Non-Residential Tier II subsurface soil cleanup goal of 25,730 ug/kg. Therefore, this COI was removed from the list of on-site soil COI.

Examination of all soil results for metals retained thus far reveal all on-site vadose zone soils are below their respective Non-Residential Tier II Cleanup Levels and all off-site vadose zone soils are below their respective Residential Tier II Cleanup Levels. Note that the metals copper and lead do not have IDEM Tier II screening concentrations. Copper is a ubiquitous metal with relatively low toxicity. The U.S. EPA Region V's *RCRA Permitting Branch Guidance: Data Quality Levels* (1994) provide a screening level of 2,900 mg/kg as a health-based criterion. All soil copper results are well below this screening criterion. Lead is also a ubiquitous metal. The EPA IRIS toxicity constants for lead exposures have been withdrawn. Currently, EPA does not have any recommended toxicity values with which to calculate health-based screening levels. The U.S. EPA Region V screening level (1994) is 500 mg/kg. Surface and subsurface soil statistics for lead are shown on Table 12. Even though one surface (current) and one subsurface (historic) soil sample have anomalously high concentrations of lead that exceed this screening level, there is not likely a significant health threat based on the facts that the average lead concentrations are well below this screening level and the arithmetic 95% UCL concentrations for lead in the surface and subsurface soils are within or approximate the 500 mg/kg screening level. Therefore, copper and lead, as well as the other metals can be removed from further consideration in this risk assessment.

Note that the surface and subsurface asbestos results reported by O'Brien & Gere (1994) are additionally represented in Table 12 along with the lead statistics for informational purposes since these data reflect a potential data gap on site. However, this assessment will not further examine the potential health threat associated with the unknown status of soils impacted with asbestos since this type of impact is not normally quantitatively evaluated in a human health threat risk assessment. Typically, when a potential health threat exists such as friable asbestos, it is usually removed and properly disposed. For this site, a removal action was taken to address asbestos impacted soils and waste brake pads found on site, but sufficient documentation does not exist to thoroughly determine whether the removal action removed all potential threat. A few brake pads were found in a crushed drum during the site walkover conducted by Fluor Daniel GTI and General Motors personnel on June 10, 1997.

After examining the data using the four screening criteria, the remaining COI for on-site subsurface soil exposure assessments is vinyl chloride. None of the off-site vadose zone soil potential COIs were retained for further evaluation. Therefore, no off-site direct contact soil exposures need to be assessed.

5.1.3 Groundwater

As stated above, the groundwater investigation at the site included laboratory analysis of groundwater samples to evaluate groundwater quality and to assess the extent and degree of potential groundwater impact potentially due to past site activities. Historical groundwater samples were collected and analyzed for the same variety of chemical groups including VOCs, SVOCs, PCBs, various TPHs, select metals, and asbestos. All chemical groups were nondetected other than VOCs. Subsequently, all current groundwater samples have been analyzed for VOCs only. A total of twenty-one groundwater samples were most recently collected and analyzed for VOCs in the first week of February 1997 as described in Section 4.4 . The current and historical groundwater analytical results for detected VOCs for all on- and off-site wells are summarized in Table 7. One hydropunch groundwater sample (HP-1) was collected in September 1995. No additional sampling was attempted at HP-1. Thus, the results for HP-1 were taken from the previous sampling event. Also note that a groundwater sample from the most downgradient off-site well to the southeast (MW-157) was recollected and reanalyzed in late February 1997 because the vinyl chloride detection limit in the sample collected previously had been reported by the laboratory with a high detection limit due to sample interferences. The latter sample results were utilized in this assessment since the vinyl chloride detection limit met the practical quantitation limit (PQL) for the method and the trichloroethene concentration in this sample was the highest measured off-site to the southeast. As with subsurface soils, the same four criteria were evaluated to select final COIs for groundwater.

The VOCs presented for groundwater in Table 7 are the list of detected target compounds which satisfies the first criterion for selecting final COIs. Acetone, a common laboratory blank contaminant, had been detected in one of 19 samples collected in the previous sampling event at a concentration well below its Tier II Cleanup Level for both residential and non-residential exposures. Therefore, based on the first, third, and fourth criteria defined above, acetone was removed as a COI. Acetone was not detected in any current groundwater samples.

A frequency summary of the COIs retained thus far for the combined on-site and off-site groundwater are presented in Table 13. This summary presents the minimum and maximum detected concentrations, the location of the maximum detected concentration, and the frequency of detections for each COI retained for further evaluation. Note that trans-1,2-dichloroethene was not included in this table since current groundwater results had no positive detections for trans-1,2-dichloroethene.

The target VOCs 1,1-dichloroethane was not detected in any of the twenty-three current groundwater samples. Thus, based on the second and third criteria used for selecting COIs of detection and prevalence, 1,1-dichloroethane was removed from further consideration. After examining the data using the four screening criteria, the remaining COIs for the on-site and off-site groundwater are vinyl chloride, total-1,2-dichloroethene, and trichloroethene.

5.1.4 Surface Water

Three surface water locations were sampled in October 1996 and February 1997 and were analyzed for VOCs as discussed in Section 4.2.2. Results of the three COIs retained for groundwater evaluations are presented in Figure 12. The October 1996 sampling event represented low flow conditions and the February 1997 sampling represented high flow conditions. The only COI detected in the two events was cis-1,2-dichloroethene. Cis-1,2-dichloroethene was not detected in the upgradient station ST-1. The two surface water stations adjacent to the two on-site plumes revealed positive detections of cis-1,2-dichloroethene in the low flow sampling event only with a maximum detected concentration of 17 ug/L. No other VOCs were detected in either sampling event.

The detections of cis-1,2-dichloroethene in these locations support the assumption that the groundwater in the upper aquifer is discharging to the Little Eagle Creek. In order to evaluate whether the detections of cis-1,2-dichloroethene would be the expected worst-case surface water conditions in the future, an aquifer-stream interaction modeling was performed. Results of this modeling are presented in Section __. Utilizing the anomalously high results in hydropunch sample HP-1 as a continuous source concentrations along the stream the model predicted that the detections found for cis-1,2-dichloroethene represent the worst-case conditions for current and future exposures. The model predicted at low flow that concentrations of vinyl chloride and trichloroethene would be below the reporting limits for the analytical method utilized. This conclusion is supported by the analytical results from two sampling events.

Literature screening values were obtained for evaluation of potential ecological receptors for cis-1,2-dichloroethene. The U.S. EPA's *Quality Criteria for Water 1986* (1987) lists an acute lowest observed effect level (LOEL) for dichloroethenes for freshwater organisms at 11,600 ug/L. The *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Freshwater Biota* (Suter, 1996) cites a Lowest Chronic Value extrapolated from an LC50 using regression at 14,680 ug/L and a Lowest Chronic Ambient Water quality criterion for fish at 9,538 ug/L. These references demonstrate that the low detections of cis-1,2-dichloroethene are almost three orders-of-magnitude less than the lowest of these literature screening values and thus, demonstrate the insignificant potential threat to ecological receptors of cis-1,2-dichloroethene in the surface waters at the site.

Since IDEM does not provide Tier II Cleanup Levels for human exposures to surface waters potentially impacted by cis-1,2-dichloroethene, a site -specific Tier III evaluation of risks associated with the most realistic exposure pathway for nearby off-site residents was performed to ascertain whether the cis-1,2-dichloroethene detections potentially posed a threat to human receptors. The only COI for surface water risk assessment evaluations is cis-1,2-dichloroethene.

5.1.5 Uncertainties Associated with Data Collection and Evaluation

Uncertainties associated with the data collection and evaluation activities include:

- the use of subsurface soil conditions to demonstrate the worst case surface soil conditions;
- the slight uncertainty associated with using soil data that were reported on a wet weight basis rather than dry weight corrected (concentration would go up by 10-20% in dry weight);
- the use of maximum groundwater results from an off-site location adjacent to the site to represent worst-case point exposure conditions for residential exposures when complete off-site delineation has not yet been completed; and
- the number of samples collected per medium and sampling locations selected to identify and define extent of impact.

Uncertainty associated with the data are also limited by the fact that the chemicals detected in soil and groundwater at the site focus on the most impacted areas. Therefore, these biased samples likely overestimate the potential risk at the GM Allison Plant No. 10 site.

5.2 Tier III Site-Specific Risk Assessment

The final COIs for soil, groundwater, and surface water that were retained will be carried through to the Tier III site-specific risk assessment. The purpose of this section is to identify realistic exposure scenarios for the site so that the Tier III site-specific human health risk assessment can be quantitatively evaluated. Both current and reasonably foreseeable future land uses of the site are considered in developing site-specific exposure scenarios. Per IDEM regulations, the risk assessment and subsequent cleanup goals, if necessary, are based on resource uses for the site and surrounding area. Tier III assessments also utilize the reasonable maximum exposures expected to occur under both current and potential future use conditions of areas impacted by a release or imminent threat of a release of hazardous substances (IDEM, 1996). These regulations and directives from IDEM substantially follow EPA guidance for performing risk assessments under the Risk Assessment Guidance for Superfund (RAGS) Parts A and B (1989a; 1991a; and 1991b).

IDEM and EPA have developed standardized methodology for quantitatively evaluating risk for soil, groundwater, and surface water exposures. This begins with the determination of probable land uses of the site and potential receptors that would be exposed to COIs in the on- and off-site soils and groundwater and the off-site surface water (IDEM, 1996).

5.2.1 Land Use

Basic physical site characteristics are discussed in Section 2.0 while basic site geology and hydrogeology characteristics are discussed in Section 5.0. The property is zoned industrial and is currently being used as a automotive parts warehouse. Land use in the surrounding area of the site is mixed use with zoning predominantly residential, general business and industrial. The properties immediately surrounding the site are:

- **North:** A city park
- **East:** Residential properties
- **South:** Wooded area and Little Eagle Creek
- **West:** Holt Road and Allison Transmission

A site vicinity map is presented in Figure 3.

As stated in Section 5.1, a basic assumption of this risk assessment is that the on-site property's reasonably foreseeable future land use is that it will continue the same as the current or historic use as a commercial/industrial property. Since the facility is supplied with a municipal water supply it has been assumed that no potential uses of on-site groundwater will occur in the future.

As discussed in Section 5.3, a domestic and municipal well location survey was completed by plotting all county registered wells that are within a one mile radius of the property. The domestic/municipal well location map is presented in Figure 4. The nearest downgradient well to the site is approximately one-quarter of a mile due south of the site. As noted above, a residential well has been identified due east of the facility but is cross gradient of the on-site plumes, is not currently impacted, and is not expected to be impacted in the future. Analytical results of water samples from on-site wells in the northeast corner of the site, which would be more upgradient of this off-site residential well do not indicate detectable VOC concentrations in any of the four groundwater sampling events to date. VOCs occurrence in shallow groundwater likely discharges into Little Eagle Creek. Therefore, it is unlikely that dissolved VOCs extend south of the stream to the south.

Since a public water supply is available to area residences, it is unlikely that wells to the southeast of the site are utilized for household use, including consumption. However, there are no ordinances in Indianapolis prohibiting the installation of a potable water supply well even where a municipal supply is available. It should be noted that MCHD personnel Paul Gilson indicated during a recent discussion with Fluor Daniel GTI that they plan to develop a program in the near future to deny well installation permits in areas where contamination is known and public water supply is available. He also stated that they were considering the use of the Allison Plant 10 site as a pilot case for this program. For conservatism, it is assumed that the groundwater immediately off-site may be used in the future as a potable water source and that the worst case intake by affected residential receptors would be the maximum off-site VOCs concentrations.

5.2.2 Potential Human Receptors

Potential human receptors who are likely to be present at the site or in the surrounding environment, and who, as a result could be exposed to COIs at the site, are identified based on the current and future land uses of the site (assumed to be industrial) and surrounding area (assumed to be mixed use including residential and industrial with the most sensitive receptors being residents). In addition, Fluor Daniel GTI assumed that the site surface will remain intact. Currently, it is covered by asphalt, concrete, and a relatively uninterrupted vegetative cover. Based on the assumed land uses specified in Section 5.4.1, the potential receptors are:

- on-site worker
- on-site construction worker
- off-site child resident
- off-site adolescent resident
- off-site adult resident

Groundwater scenarios for residents will not be separately evaluated for child and adult residents in accordance with scenarios evaluated by IDEM for calculation of Tier II Cleanup Goals (IDEM, 1996). The off-site adolescent resident receptor will only be specifically examined for the recreational use of the Little Eagle Creek. Additionally, residential receptors are the only receptors examined off-site for two reasons:

- Based on potential durations and frequencies of exposure, off-site residents who live nearby the property are the most sensitive of any reasonably expected future or current off-site receptor groups; and

- Because off-site data are limited to locations immediately adjacent to the facility property line, off-site extent of impact is uncertain and worst case exposures of COI concentrations from these adjacent sample locations are assumed.

On-site trespassers have not been included because the property is securely fenced and potential trespassers are extremely unlikely to regularly contact on-site surface soils based on the current and assumed future surface cover that is in place. Additionally, on-site trespassers would be even less likely to ever come into contact with on-site subsurface soils or groundwater. Therefore, the on-site trespasser receptor who may normally be evaluated for this type of risk assessment will not be examined.

5.2.3 Exposure Pathways

5.2.3.1 Soils

The following pathways are considered significant for surface and subsurface soils for on-site non-residential uses per IDEM guidance:

- incidental ingestion of soil
- inhalation of volatiles and soil particulates

Therefore, these exposure pathways for soils were considered the most significant when considering the site-specific receptors. As stated in Section 5.1, other exposure pathways, including the dermal route, are not evaluated, but are considered by applying IDEM's maximum upper limits (IDEM 1996) for each chemical class.

Receptors may contact site-related COIs in the following ways based on site conditions.

- An on-site worker at the site may come into contact with surface soil during daily work activities under current conditions because the site is not entirely paved. In the future, this exposure pathway is uncertain. The surface soil exposure routes would be incidental ingestion of soil and inhalation of volatile vapors and soil particulates. The potential also exists for an on-site worker to come into contact with subsurface soils under very limited conditions if the worker's responsibilities included facility maintenance. This type of exposure would be expected to be infrequent and last for a short time period. The exposure routes would also include incidental ingestion of soil and inhalation of volatile vapors and soil particulates.

- An on-site construction or utility worker at the site may come into contact with surface and subsurface soil during routine utility maintenance activities or future construction activities involving excavation. The exposure routes would be the same as for the on-site worker except

the construction or utility worker would be expected to be exposed for a much shorter duration to both surface and subsurface soil.

5.2.3.2 Groundwater

The following pathways are considered the most significant for off-site residential groundwater uses:

- ingestion of groundwater used as a potable water source
- inhalation of volatiles from the groundwater used as a potable water source
- dermal contact with groundwater used as a potable water source
- inhalation of volatilized vapors intruding into residences from impacted groundwater beneath the residence's foundation or basement

Therefore, these exposure pathways for groundwater were considered the most significant when evaluating the site-specific receptors. On-site non-residential groundwater exposure pathways will not be further evaluated in this risk assessment based on the following rationale:

- An on-site worker at the site is very unlikely to ingest groundwater during daily work activities since well water has not previously been used nor will likely be used as a potable water source on-site. The facility is connected to the local public water supply and it is unlikely that condition will change in the future use of the site. A deed restriction may be necessary to guarantee this assumption remains intact in the future. The groundwater exposure route of inhalation of volatile vapors from and dermal contact with on-site groundwater is unlikely for on-site workers because the typical pathway for this exposure route is via showering or bathing using well water. Inhalation of volatilized vapors intruding into the on-site building is unlikely since the plumes on site are not beneath the building, appear to be moving away from the building, the indoor air volume as a warehouse type of structure would allow significant dilution of potentially intruding vapors, and the indoor air exchange rate with large warehouse doors would tend to be quite high (which would allow for frequent fresh air replenishment).

- An on-site construction worker at the site is also unlikely to ingest groundwater during future construction activities since well water has not previously been used nor will likely be used as a potable water source on-site. It is unlikely that a future on-site construction worker would physically come into direct contact with groundwater on-site during excavation activities because the typical depth to groundwater is 11 to 13 feet below the surface. This is deeper than most depths required under normal construction activities. The on-site construction worker would also unlikely be exposed to routes other than ingestion for the same reason as for on-site workers.

5.2.3.3 Surface Water

The only single pathway that could potentially be considered significant for surface water exposures considering the stream size and nature would be for an off-site resident's use of the creek for recreational purposes. Normally, adolescent residents would be the most realistic receptor for this type of stream use. Young children and adults are unlikely to use the stream in this capacity. Other potential exposure pathways such as ingestion of wildlife that may exist in the stream is extremely unlikely because of the physical setting of the stream such as size, ability to support biota, and accessibility by potential receptors.

5.2.4 Quantify Exposure Pathways

For assessment of groundwater direct contact exposure risks (ingestion, inhalation, and dermal contact with groundwater used as a potable water source), the only receptor retained for evaluation was the off-site resident. Since the State of Indiana Tier II Residential Goals were developed with the specific intention to be protective of residential exposures to impacted groundwater, site specific direct contact groundwater exposure human health risks will not be quantitatively estimated herein. Instead, groundwater concentrations were evaluated by comparing each COI to its respective Tier II Residential Goal. Each groundwater COI for this baseline risk assessment has a Tier II Residential Goal. These values are typically their federal Maximum Contaminant Levels (MCLs). However, the indirect exposure route of inhalation of volatilized vapors from groundwater intruding into an off-site resident's basement were quantitatively evaluated to ascertain whether this exposure route is significant.

The majority of exposure input parameters for the soil, groundwater, and surface water exposure risk assessments for pathways not evaluated solely by direct comparison to Tier II cleanup goals were taken directly from IDEM's Intake Assumption tables for calculation of the Tier II Cleanup Goals, as applicable (IDEM 1996). Site specific exposure parameter values were substituted for IDEM's default values for a few intake parameters. In general, there are three categories of variables that are used in these equations:

- COI-related variables -- absorption factors, soil/air and groundwater/air volatilization factors, and particulate emission factors;
- variables that describe the exposed population – intake rate and body weight; and
- assessment-determined variables -- exposure frequency and duration; and averaging times.

The variables and associated values used for soil, groundwater, and surface water exposure pathway-receptor combinations evaluated are presented on their respective quantitative risk assessment and

related calculation tables (Tables 14 through 20). The variables and values for the identified exposure pathways for each exposure scenario are described below.

5.2.4.1 COI-Related Variables.

Absorption Factors: An absorption factor (AB) defines the fraction of chemical which is expected to be absorbed through the body based on the route of exposure. This factor depends on the chemical and physical properties of the specific compound. Usually complete absorption (100%) is assumed for chemicals when exposure occurs via inhalation or ingestion (EPA, 1989a; 1989b). Assuming total absorption is the most health protective as there are few compound-specific studies in humans available in the literature that can be used to estimate absorption into the body. Therefore, for all identified receptors 100% absorption was assumed for the ingestion and inhalation exposure pathways. As such, this variable does not appear in any of the formulae for risk calculations as it would have no difference in impact to the result.

The dermal permeability constant (PC) defines the rate a chemical in water will absorb into the body based on dermal contact. This factor is also dependent on the chemical and physical properties of the specific compound. However, PC reference values for the COIs selected in this assessment could not be individually determined. EPA guidance (1989a) recommends using a default PC value for water as a substitute. This PC value is 8.4×10^{-4} cm/hour.

Volatilization Factor: The volatilization factor (VF_{soil}) relates the concentrations found in soils to the amount of volatile vapor that can be expected to be released into the ambient air through volatilization. One basic assumption for this model is that the formula is designed on the assumption that the source is homogenous, continuous, and constant without any impediments or retardation of the vapors volatilizing from the soil. The VF_{wesp} relates the concentrations found in groundwater beneath the surface through the soil and intruding into an enclosed space such as a basement through a foundation or floor crack. These factors are chemical-specific and relate to individual physical constants such as partitioning coefficients, Henry's Law constants, and chemical diffusivities. The formula for calculating site-specific VFs for soils for all COIs is found in IDEM Tier II Cleanup Goal guidance (IDEM 1996). The only values used in the formula for calculating soil VFs that were not IDEM default values or literature-based physical values were the length of the on-site area affected and the total surface area which were both estimated. The literature reference for all chemical-specific physical inputs, except for K_{oc}, was from the U.S. EPA's *Technical Background Document for Soil Screening Guidance* (1994). A K_{oc} value was estimated for vinyl chloride using Equation 4-5 from the *Handbook of Chemical Property Estimation Methods* (Lyman et al. 1993). Table 14 is a summary of all parameters and values used in calculating the site-specific VFs for the two remaining vadose zone soil COIs. The VF_{soil} value was 108 m^3/Kg for vinyl chloride.

The formula for calculating a site-specific VF_{wesp} for the only groundwater COI detected above its respective Residential Tier II Cleanup Level in an off-site well (trichloroethene) is from the Johnson and Ettinger model (1991) as represented in the American Society of Testing Materials (ASTM) *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (RBCA) (E1739-95) (1995). The only values used in the formula for calculating the VF_{wesp} that were site-specific were values related to the depth of water below the point of intrusion. The average depth to groundwater in the three off-site wells to the southeast was 11.4 feet. Assuming the affected residence has a basement with a typical construction would leave approximately six feet below the surface to the basement floor. Therefore, the approximate assumed depth below a basement to the groundwater in the upper aquifer off-site is five feet. Calculation of the site-specific VF_{wesp} is presented on Table 15 along with the formula and all parameters and values used. The calculated VF_{wesp} for trichloroethene was 6.31×10^{-3} mg/m^3/mg/L air-to-water.

Particulate Emission Factor: The particulate emission factor (PEF) relates the concentration of a COI in soil with the concentration of respirable particles (PM_{10}) in the air due to fugitive dust emissions from the site. This relationship is derived by Cowherd (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission. Particulates of fugitive dust emissions from sites are due to wind erosion and, therefore, depend on the erodibility of the surface material. EPA has suggested a default PEF of 4.63×10^9 m^3/kg (EPA, 1991a). A site-specific PEF was calculated using the formula presented in IDEM's Tier II Cleanup Goal guidance (IDEM 1996). Calculation of the site-specific PEF is also presented on Table 14 along with the formula and all parameters and values used. The only non-default or non-lookup parameter values were for vegetative cover and threshold wind speed which were both estimated. The site-specific PEF calculated was 1.7×10^{12} m^3/Kg.

5.2.4.2 Exposed Population Variables.

Exposure population variables are those assumptions associated with each identified receptor. These variables include body weight and intake rates for specific routes of exposure.

Body Weight: The body weight (BW) was assumed to be 70 kilograms (kg) for all adult receptors in accordance with EPA guidelines (EPA 1989b) and is the IDEM default value (1996). This value represents the average body weight for male and female adults. For an adolescent resident, the body weight used was the average weight for teenagers male and female for the age categories 12-15 and 15-18, as presented in the U.S. EPA's RAGS (1989b).

Soil Ingestion Rate: The ingestion rate (IR_{soil}) used is believed to represent an upper-bound value for soil ingestion. The IDEM default IR_{soil} values were used for soil exposure calculations. Thus, a value of 50 mg/day was used as the default IR_{soil} for adults in the "typical" workplace for the on-site worker. For the

on-site construction worker an IR_{soil} of 100 mg/day was used as construction activities involve a more significant disturbance of soil.

Inhalation Rate: Inhalation rates (IR_{air}) of 15.5 m^3/day and 24 m^3/day were calculated using EPA (1989b) data for a site-specific industrial soil exposure for an on-site worker and an on-site construction worker. These values were calculated by combining reasonable worst-case inhalation rates for indoor and outdoor activities estimated in the EPA's Exposure Factors Handbook (1989b). EPA guidance lists the reasonable worst-case outdoor inhalation rate as 3.0 m^3/hour and the reasonable worst-case indoor inhalation rate as 0.89 m^3/hour. To calculate site-specific inhalation rates for on-site workers and construction workers, it was assumed an on-site worker would have a maximum split of indoor / outdoor activities as 50 percent for each on a routine basis and a construction worker would have a maximum of 100 percent outdoors. Therefore, based on an 8 hour workday, an on-site worker's estimated total inhalation rate while on-site would be approximately 15.5 m^3/day and an on-site construction worker's estimated total inhalation rate while on-site would be approximately 24 m^3/day.

The inhalation rate for an off-site resident's indoor exposure to volatilized vapors is the EPA and IDEM default value for an adult receptor of 15 m^3/day.

Contact Rate: The EPA default (1989a) contact rate (ingestion) for water during swimming activities of 50 mL/hour was utilized for the surface water exposure.

5.2.4.3 Exposure Scenario Variables.

Exposure scenario variables are those assumptions that describe the duration and time of exposure for identified exposure pathways.

Exposure Frequency, Duration and Time: Exposure frequency (EF) is the number of times a receptor is expected to be exposed to a COI usually expressed as days/year. The exposure duration (ED) is the amount of time a receptor is assumed to be exposed. For the most part, IDEM and EPA recommend that upper-bound values be selected for these exposure variables as part of the reasonably maximum exposed receptor.

Exposure frequency and duration for an on-site worker recommended by EPA and IDEM were values of 250 days per year for 25 years. These time factors are based on an 8-hour workday (ET) and assume a work period of 5 days per week for 50 weeks based on a two-week vacation (EPA, 1991b). For surface and subsurface soil exposures, the 250 days per year EF value was adjusted since it could be assumed the majority of the work at the property would be inside and since the frequency does not account for inclement weather. The ground is estimated to be snow covered or frozen approximately five months of the year in Indiana. For the shorter term that an on-site worker could normally be exposed to surface and

subsurface soils considering weather conditions and the number of normal working days during fair weather conditions, an EF of 120 days/year was used for both surface and subsurface soil exposures. The ED remained 25 years for soil exposures for this receptor for surface exposures. Since the on-site worker would be expected not to be routinely exposed to subsurface soils except during construction or maintenance that disturb the surface cover, the ED for subsurface soil exposures for an on-site worker was estimated as a maximum of 2 years for multiple surface disturbances during an employees duration of employment.

The on-site construction worker was assumed to work 8-hour work shifts 5 days per week for a six-month time frame. This accounts for any type of construction activities being completed for the site under both current and future land use. This results in an EF of 120 days/year with an ED of 0.5 years for soil exposure pathways.

The off-site resident exposures are based on the upper bound maximum duration that a resident would be expected to live in one residence, which is 30 years. This is both the EPA and IDEM recommended value for a resident's ED. EPA and IDEM recommend using an EF of 350 days/year for all residential exposures. This value was used for the groundwater-to-indoor air residential exposure pathway examined.

The EF and ED for an adolescent resident's exposure to the Little Eagle Creek for recreational uses is based on the assumption of two events a week during an approximate 12 week summer during prime adolescent ages of 12 to 18 years old for an ED of approximately 25 events/year and an ED of 6 years. An estimated 2 hour ET duration per event was assumed.

Averaging Time: Averaging time (AT) is the total amount of time a receptor is exposed to a COI. For carcinogens the AT is 25,550 days. This is based on the assumption that an individual has an average lifetime of 70 years and is exposed 365 days/year. For noncarcinogenic endpoints, the AT is based on the specific ED in years for each pathway multiplied by 365 days/year.

5.2.5 Uncertainties Associated with Exposure Assessment

The most significant uncertainty associated with the exposure assessment that influences the calculation of site-specific human health risks is the accuracy in characterizing land uses. It is assumed that future land use of the site will remain industrial. Although the property could conceivably be redeveloped in the future for residential use, the assumptions regarding land and groundwater use at this site carry a high degree of confidence because they are based upon multiple factors that strongly support continued industrial use into the foreseeable future (e.g., zoning, historical use and current building trends). In

addition, as a requirement of the IDEM VCP, a deed restriction for this project site may need to be developed to limit future use of the property to industrial use and to restrict future on-site groundwater use.

Parameters such as inhalation and ingestion rates, assuming 100% absorption, exposure duration and frequency are high-end estimates to conservatively calculate health-based risks. Other exposure parameters such as body weight are average values following IDEM and EPA recommendations that a range of upper-bound and average values should be used to estimate exposure. Thus, although uncertainty is present in the exposure parameters, the parameters were selected such that resulting exposures are most likely overestimated to be protective of human health.

One additional uncertainty in the exposure assessment deals with the use of simple chemical transport/migration models. Typically, these models have basic assumptions that perfect physical conditions will be in effect, that the sources are continuous, constant, homogeneous, and nondegrading or retarding from the source to the final point of intake by the receptor. However, under realistic conditions, all of these assumptions being true is highly unlikely. These simple and rapid models tend to also overestimate transport mechanisms' efficiencies since it is unlikely that all of these conditions can be simultaneously true.

5.2.6 Toxicity Assessment

As part of performing the Tier III risk assessment, a toxicity assessment is required. The toxicity assessment involves evaluating the dose-response relationships for the COIs. This includes an assessment of the types of health effects associated with the exposure to site-related COIs and the relationship between the magnitude of the exposure and the adverse effects. The toxicity assessment determines the quantitative relationship between the dose of a COI and the incidence of adverse health effects. The end result of the toxicity assessment is the derivation of toxicity values which are used to calculate Tier III human health risks.

The EPA has developed two sets of toxicity values that provide quantitative estimates of the potency of chemicals and resultant toxic effects. These toxicity values are known as reference doses (RfDs) and cancer slope factors (CSFs). RfDs are used to evaluate the noncarcinogenic toxic effects while CSFs are used to evaluate the carcinogenic effects of COIs.

5.2.6.1 Toxicity Values for Noncarcinogenic Effects

Noncarcinogenic effects, such as organ damage or reproductive effects, are evaluated by reference doses (RfDs). The reference dose for an individual COI is expressed in units of milligrams per kilogram per day (mg/kg-day). The RfD is usually based on the relationship between the dose of a COI and the occurrence of systemic toxic effects in either experimental laboratory animals or humans. The methodology for

deriving a reference dose inherently assumes that there is a threshold intake rate below which no adverse effect will occur. Generally, a No Observed Adverse Effect Level (NOAEL) is divided by a safety factor to obtain a RfD that is intended to provide a benchmark for the daily dose to which humans, including sensitive populations such as children, may be subjected without an appreciable risk of deleterious effects during a lifetime (assumed to be 70 years).

Safety factors are factors of 10 that account for interspecies variation and sensitive human populations. These include variation in the general population (intended to protect sensitive subpopulations such as children and the elderly) and extrapolation from animal data to humans. Additional factors of 10 are included in the safety factor if the RfD is based on the lowest observed adverse effect level (LOAEL) instead of the NOAEL, or an experiment that includes a less-than-lifetime exposure.

5.2.6.2 Toxicity Values for Carcinogenic Effects

For carcinogens, the EPA has developed a classification system based on the weight of evidence that a compound is a human carcinogen. The classification system is defined as:

- Group A - Human Carcinogen
- Group B - Probable Human Carcinogen
  - B1 - limited human data are available
  - B2 - sufficient evidence in animals and inadequate or no evidence in humans
- Group C - Possible Human Carcinogen
- Group D - Not classifiable as to human carcinogenicity
- Group E - Evidence of non-carcinogenicity for humans

For COIs classified by EPA as potential human carcinogens, risk is evaluated differently, because noncarcinogenic and carcinogenic effects are believed to have different mechanisms of action. Typically animal carcinogenicity studies are conducted using relatively high doses. To evaluate the possibility of developing cancer at the low doses more frequently encountered in the environment, the linearized multistage model is used. This mathematical model expresses cancer risk as a function of exposure. The model is based on the assumption that even a single, low-dose exposure to a carcinogen may result in cancer. In other words, it is assumed that there is no threshold for any dose of a compound classified as a carcinogen.

The EPA's Carcinogen Assessment Group reviews human, animal and *in vitro* data regarding suspected chemical carcinogens and calculates cancer slope factors (CSFs) for those determined to be carcinogens. CSFs are upper-bound estimates of the excess cancer risk due to continuous exposure to a COI averaged throughout the course of a 70-year lifetime. A CSF has units of milligrams of chemical per kilogram of body weight per day [1/(mg chemical/kg body weight-day)] or 1/(mg/kg-day) and provides a

health-protective estimate of the probability of developing cancer from exposure over a lifetime. By definition, there is only a 5 percent chance that the probability of developing cancer is higher. The basis of a CSF is data from lifetime animal bioassays, although human data are used when available. The CSF represents the upper 95% confidence limit of the slope of the linear portion of the dose-response curve. The excess carcinogenic risk for the experimental animal is then extrapolated to the excess carcinogenic risk expected for humans. The resulting values from this model are more likely to overestimate than to underestimate the potential risk.

5.2.6.3 Toxicity Information for COI

Verified toxicity values were obtained from the current (May 1996) U.S. EPA Region III's Risk Based Concentration Table which utilizes the EPA's *Integrated Risk Information System* (IRIS) on-line computer database (EPA, 1995) as a primary source. These toxicity values and other chemical-specific information are included in IRIS after a comprehensive review of toxicity data by work groups of EPA health scientists. Verified toxicity values are the most reliable for estimating carcinogenic and noncarcinogenic risks due to COI exposure. Therefore, the toxicity values used for the COIs for this risk assessment are as follows:

Constituent	Inhalation / Oral	Cancer Slope Factor (CSF) (Kg-day/mg)	Reference Dose (RfD) (mg/Kg-day)
Vinyl Chloride	Inhalation	0.3	N/A
c-1,2-Dichloroethene	Inhalation	N/A	N/A
Trichloroethene	Inhalation	0.006	N/A
Vinyl Chloride	Oral	1.9	N/A
c-1,2-Dichloroethene	Oral	N/A	0.01

5.2.7 Uncertainties Associated with the Toxicity Assessment

Uncertainties associated with the toxicity assessment include:

- The quality of the studies used as the basis for the COI-specific toxicity values;

- Potential differences in toxicity and absorption efficiency between laboratory animals and humans;
- The applicability of studies conducted in experimental laboratory animals at high dose levels to human exposures at lower concentrations;
- The validity of the critical underlying assumption in the dose response model for carcinogens that there is no threshold for carcinogenesis (i.e., there is no dose of a carcinogen that is not associated with a risk of cancer);
- Calculation of lifetime excess cancer risk on the basis of less than a lifetime exposure;
- Potential synergistic or antagonistic interactions of chemicals to which the same individual may be exposed;
- Oral toxicity values used when no inhalation toxicity values were available; and
- Use of chronic toxicity values to evaluate short-term subchronic exposures when subchronic values are unavailable.

Because of these uncertainties, methods for developing toxicity values (RfDs and CSFs) are designed to be conservative. For example, cancer slope factors derived by the EPA are for the most part based on the upper 95th confidence limit. The use of uncertainty factors in the derivation of RfDs are devised to be health protective, accounting for limitations in available data and extrapolation from experimental conditions to exposure scenarios identified for site specific-conditions. As a result, calculation of risks using EPA-derived toxicity values should be conservatively protective of human health.

5.2.8 Calculation of Tier III Human Health Carcinogenic and Non-carcinogenic Risks

Once the exposure pathways, parameters, and toxicity values are identified, the Tier III human health risks can be calculated. There are two general equations used in calculating potential human health effects for carcinogens and non-carcinogens. Both of these equations are based on the estimated chronic daily intakes (CDI) calculated for each receptor and pathway retained for quantitative risk assessment. The equations for the CDIs are presented on the risk calculation summary tables (Tables 16 through 20). The formulae for the CDIs are taken directly from the EPA RAGS guidance document (EPA, 1989a). These same formulae are presented in terms of calculating remedial goals in the IDEM guidance document for Tier II Cleanup Goals (IDEM, 1996).

For carcinogenic effects, the excess cancer risk due to a lifetime exposure to the estimated chronic daily intake of each carcinogen is calculated using the following equation:

$$\text{CANCER RISK} = \text{CSF} \times \text{CDI}$$

where CSF is the cancer slope factor and CDI is the lifetime estimated chronic daily intake (CDI) or dose. Since the units of CSF are $(\text{mg/kg-day})^{-1}$ and the units of dose or intake are (mg/kg/day), the risk is unitless.

For compounds classified as carcinogens, the estimated risks appear in scientific notation. Thus a risk of 1×10^{-6} means that one additional person in an exposed population of one million (1,000,000) individuals may develop cancer during a lifetime of exposure to the compound. IDEM has adopted a cumulative incremental cancer risk (ICR) limit of 1×10^{-6} as the point of departure for sites with unrestricted future use (i.e., includes residential) and 1×10^{-5} as the target cancer risk level for current and future land use restricted to non-residential purposes. In this assessment, the site was assumed to remain non-residential, therefore, a risk limit of 1×10^{-5} was used to evaluate Tier III carcinogenic risks on site. A risk limit of 1×10^{-6} was used to evaluate Tier III carcinogenic risks off site.

Noncarcinogenic effects were quantified using the hazard index approach as recommended by IDEM. A hazard index (HI) is the ratio of the estimated chronic daily intake and a reference dose considered to be the level where adverse health effects would not be observed (these doses have also been called "safe" or "acceptable").

$$\text{HI} = \text{CDI}/\text{RfD}$$

CDI is the estimated chronic daily intake and the RfD is the reference dose. Since the units of CDI and reference dose (RfD) are both (mg/kg-day) the hazard index (HI) is unitless.

According to IDEM, a HI less than 1.0 suggests that no adverse health effects would result from exposure to compounds that do not bioaccumulate and 0.2 as a HI for compounds that bioaccumulate. Table 1 of the Water Quality Criteria for Specific Substances (Indiana Register, Volume 16, Number 7, April 1, 1993) was the basis for determining whether a compound bioaccumulates. None of the COIs evaluated in this assessment bioaccumulate.

These equations were then used to calculate direct contact health-based carcinogenic and non-carcinogenic risks for each COI for soil, groundwater, and surface water using IDEM's defined cancer risk limit and hazard indices for retained residential (off-site) and non-residential (on-site) scenarios. Note again that quantitative evaluations of off-site impacted groundwater residential use has not been performed since the Residential Tier II Cleanup Levels were specifically developed for protection of this scenario.

5.2.8.1 Tier III Non-Residential Risks

Tier III carcinogenic and non-carcinogenic human health risks for on-site workers' non-residential surface and subsurface soil exposures are summarized on Tables 16 and 17, respectively. Tier III carcinogenic and non-carcinogenic human health risks for on-site construction workers' non-residential surface and subsurface soil exposures are summarized on Table 18. Since subsurface soil data were used for actual subsurface soil conditions as well as worst case surface soil conditions and all exposure inputs for risk calculations are the same for both surface and subsurface exposures for an on-site construction worker, the resulting risks for either exposure are the same. Thus, they are both presented on one risk calculation summary table.

5.2.8.2 Tier III Residential Risks

As explained above, residential surface water exposures have been examined for an adolescent age category of 12 through 18 years old based on this being the most likely receptor for this type of exposure. Tier III non-carcinogenic human health risks for the off-site adolescent residential surface water exposures are summarized on Table 19. Tier III carcinogenic human health risks for the off-site residential indirect contact groundwater exposures are summarized on Table 20.

As stated above in Section 5.2.4, off-site residential groundwater exposures were assessed by comparing groundwater concentrations of each COI to its respective Tier II Residential Goal. Since residential groundwater exposures can only occur (even potentially) for groundwaters off of the Allison Plant No. 10 site, Tier II Residential goals need only be evaluated at the property boundary and/or monitoring well locations off-site. This exercise was performed in Section 5.5.2. All current groundwater results for positively detected VOC's were presented along with the Tier II Non-Residential and Tier II Residential Goals. Off-site groundwater locations discussed in Section 5.5.2 to the west or south of the facility were not evaluated as Little Eagle Creek was assumed to be the only realistic receptor of the plume in the western portion of the property moving towards the south-southeast. Of the five off-site groundwater sample locations to the southeast of the facility (MW-151, MW-156, MW-157, MW-201, and MW-301), the wells MW-201 and MW-301 monitor deeper aquifers that have shown no evidence of the same impact

found in the upper aquifer. Well MW-151 and MW-156 had positive detections of cis-1,2-dichloroethene in the current sampling but the concentrations were well below the Tier II Residential Cleanup Level of 70 ug/L. Wells MW-156 (52 ug/L) and MW-157 (100 ug/L) had trichloroethene results exceeding their respective Tier II Residential Goal of 5 ug/L. The concentration for trichloroethene in MW-157 was used as a worst-case representative concentration term for the off-site groundwater-to-indoor air exposure assessment.

On-site groundwater sample location MW 10-1, located a few feet west of the eastern property line along Olin Avenue, had trichloroethene (810 ug/L) and cis-1,2-dichloroethene (120 ug/L) concentrations above their respective Tier II Residential Goals of 5 ug/L and 70 ug/L, respectively.

5.3 Risk Assessment Conclusions

Site-specific human health risks were calculated for the Allison Plant No. 10 site located on Olin Avenue in Indianapolis, Indiana using IDEM and EPA risk assessment methodology. A summary of all carcinogenic risks calculated for all soil exposure pathways and all receptors described in Sections 5.2.8.1 and 5.2.8.2, are presented in Table 21. As can be seen from the summary of risks in Table 21, no soil carcinogenic risks for non-residential exposures to soils exceeded the 1×10^{-5} target risk level. The only on-site soil COI, vinyl chloride, does not have non-carcinogenic toxicity constants. Therefore, no soil non-carcinogenic hazard indices for non-residential exposures were estimated. On-site and off-site soil COI concentrations found do not appear to pose a significant human health threat.

The surface water non-carcinogenic risks, also presented in summary in Table 21, were below the EPA's target hazard index of 1.0. Cis-1,2-dichloroethene, the only surface water COI, does not have carcinogenic toxicity constants. Therefore, no surface water carcinogenic risk levels were estimated. Off-site surface water COI concentrations found do not appear to pose a significant human health threat.

Based on the noted exceedances of the Tier II Residential Goals at property boundaries and/or at off-site locations, it is apparent that potentially unacceptable risks are posed by potential direct contact (ie ingestion) groundwater exposures to off-site residents in the immediate vicinity of the subject site. However, an evaluation of volatilized vapor from groundwater to indoor air using data from well MW-157 posed no significant human health threat for offsite residents.

The methodology used throughout this report is in compliance with both State of Indiana and federal regulations and guidance for protection of the environment. The human health risk assessment performed is based on the assumption that the site will remain industrial, site surface conditions will remain fairly constant, and the future potable water source will remain as the public water supply. The purpose of

calculating human health risks is to provide information to General Motors that assists them in making informed decisions regarding whether remedial actions may be necessary for the site.

The individual risks were calculated using all available data provided to Fluor Daniel GTI, Inc. and by following IDEM (1994) and EPA guidance documents. In cases where the available data were limited, reasonable assumptions were used and are clearly documented. Additionally, uncertainties inherent in the process were summarized throughout this section. Generally, the uncertainties error on the side of conservatism. Therefore, overall the human health risks estimated are conservative and are not likely to underestimate potential risks to potentially exposed receptors.

6.0 SUMMARY & CONCLUSIONS

Fluor Daniel GTI, Inc. has completed a Remedial Investigation for the Allison Engine Company, Plant 10 in Indianapolis, Indiana. The scope of work has been completed, and when considered as a whole, to be consistent with the National Contingency Plan as referenced in 40 CFR 300.700 (Subpart H-Participation by Other Persons). The purpose of the investigation was to better define the magnitude and extent of volatile organic compounds (VOCs) in the soil and groundwater and to assess potential environmental risks to their occurrence. Metals in surface soil were also investigated.

Activities completed during the investigation included the advancement of fourteen soil borings, one Hydropunch, and six Geoprobe borings; collection of soil samples for laboratory analysis; the installation of nine shallow and five deep monitoring wells in the fourteen borings; surveying of all new wells; groundwater elevation monitoring and sampling of all wells on-site; stream survey and sampling of Little Eagle Creek; and rising head permeability tests from the newly installed wells. Results of the investigation were used to more fully characterize the geology and hydrogeology of the site, to further delineate VOCs and metals occurrence, and to assess the potential risk of VOCs and metals occurrence to human health and the environment.

- Surface elevations at the site range from approximately 715 feet to 705 feet near Little Eagle Creek to the south. The subsurface of the site area is characterized by two thick layers of sand separated by a layer of silty clay. Another discontinuous layer of silty clay is found at the surface. The lower sand unit was not encountered at the maximum depth of penetration (65 feet) in the western area. Based on a comparison to published data, the two sand units are assumed to be the middle and lower confined aquifers of Meyer et al (1975). The intermediary silty clay unit ranges in thickness from approximately 8 feet to >33 feet. According to Meyer, et al, (1975), this clay layer acts as a semipervious confining bed (aquitard).

- Based on data collected during three gauging events in 1995 and 1997, groundwater occurs at elevations ranging from 698.92 to 703.75 feet in the shallow water bearing unit, 698.83 to 701.00 feet in the lower sand unit, and 689.10 to 700.68 feet in the intermediary clay unit. Groundwater elevation data indicates groundwater flows generally towards the south (Little Eagle Creek). A comparison of groundwater elevations in the three well clusters indicated a downward gradient in the western portion of the site and east of the plant. An upward gradient was observed offsite to the southeast. Rising head permeability tests indicated average hydraulic conductivities of 137 feet per day in the shallow sand unit, 8.7 feet per day in the lower sand unit, and 0.012 feet per day in the intermediary clay. Based on the low hydraulic conductivity of the intermediary unit, it appears to act as an aquitard between the aquifers.

- Analytical results for soil samples collected from the vadose zone during the current and previous investigations indicated the presence of VOCs in 17 of the 23 samples collected. TCE and 1,2-DCE were the most frequently detected compounds. Concentrations of TCE ranged from 29 ug/kg to 120,000 ug/kg. 1,2-DCE concentrations ranged from 4 ug/kg to 12,000 ug/kg. Levels of adsorbed VC ranged from 12 ug/kg to 500 ug/kg. TCE was detected on site at one location above the Tier II Non-Residential Closure Goal of 25,730 ug/kg. VC was detected at one location above its Tier II Non-Residential Closure Goal of 130 ug/kg. Using the Tier II Non-Residential Closure Goals as delineation, VOCs occurrence in soil has been defined.

- Using TCE as an indicator, multiple source areas appear to be present in the western portion of the site (e.g.: MW-132, GP-2, and MW-133). A soil sample collected from the air/water interface southeast of the plant building (MW10-1) contained 3,800 ug/kg TCE. This value was within the same order of magnitude as two groundwater samples collected from this location, therefore, it is not clear whether a source is present in this area. Levels of TCE an order of magnitude lower were measured in samples collected from the vadose zone on the southeast side of the plant building (MW-152) and further to the south (GP-5). These may represent other small source areas.

- One sample collected southeast of the property contained a TCE concentration above the Tier II Residential Cleanup Goal. The sample, collected from a depth of 18-20 feet contained 170 ug/kg TCE which is above the Tier II Residential Cleanup Goal of 80 ug/kg. This sample was however, collected from below the water table. The groundwater sample collected from this location contained 280 ug/l TCE and therefore the soil results may reflect the presence of TCE in the groundwater.

- A total of 28 of the 41 groundwater samples collected from monitoring wells during the period of July 1995 to February 1997 contained detectable concentrations of VOCs. Samples from seven

of the wells were below detection limits for all analyzed constituents. As was the case with soil, the most frequently detected compounds were TCE and 1,2-DCE. Analytical data indicate detectable TCE concentrations ranged from 5.4 ug/L to 13,000 ug/L, {cis} 1,2-DCE concentrations ranged from 5.3 ug/L to 65,000 ug/L, {trans} 1,2-DCE concentrations ranged from 5.9 ug/L to 1,400 ug/L, and detectable VC concentrations ranged from 12 ug/L to 3,400 ug/L. Wells located west, southwest, and southeast of the building and/or property contained TCE, 1,2-DCE, and/or VC concentrations above the Tier II non-residential cleanup goals. Based on this data, VOCs occurrence in groundwater has not been delineated horizontally south and east of MW-157. However, two additional wells are planned for this area. VOCs occurrence in groundwater south of HP-1 near Little Eagle Creek also has not been delineated. Shallow groundwater likely discharges into Little Eagle Creek, and therefore, it is unlikely that dissolved VOCs occurrence extends south of the creek.

- Based on isoconcentration maps constructed for TCE, 1,2-DCE, and VC in groundwater, at least two potential source areas of elevated concentrations were identified. These areas are west of the building in the vicinity of MW-132 and southeast of the building in the vicinity of MW10-1. Non-determined aliphatic hydrocarbons were detected in samples collected from MW-157 offsite to the southeast. The occurrence of these compounds appears to be localized in the vicinity of the well and not the site.

- Groundwater data collected during previous investigations were compared to recent data to evaluate trends in dissolved VOCs concentrations. Historical dissolved VOCs data are provided in Table 7. In general, most of the wells did not exhibit major changes in dissolved VOCs concentrations with time. Dissolved VOCs concentrations did increase in wells MW-132 and MW155. Detected concentrations decreased in wells MW-148, MW-153, and MW-156. Wells MW-132 and MW155 are located in the western potential source area. Well MW-148 is located downgradient of MW-132. MW-153 is located in the well cluster located southwest of the building and MW-156 is located offsite to the southeast.

- The discharge (stream flow volume) of Little Eagle Creek was measured on October 4, 1996 and February 10, 1997. Maximum stream flows of 8 cfs and 23.77 cfs were measured for these dates, respectively. Data collected from a gauging station 1.2 miles upstream indicated historical average flows of 11.1 cfs and 30.54 cfs, respectively, for the two months. This suggests that the gauging station data could be used to describe general stream flow trends.

  Loading of VOCs to Little Eagle Creek were estimated using concentrations in groundwater at HP-1 and the above stream flow data. A concentration of 25 ug/L 1,2-DCE was predicted to be detected in Little Eagle Creek using the October, 1996 flow data. The actual concentration

measured in Little Eagle Creek near HP-1 in October, 1996 was 17 ug/L. The predictive model and laboratory analytical results both indicated that detectable TCE and VC concentrations were not present in Little Eagle Creek in October 1996 and February 1997. Both also indicated that detected 1,2-DCE concentrations were not present in February 1997.

- Site-specific human health risks were calculated for the site using IDEM and EPA risk assessment methodology. No soil carcinogenic risks for non-residential exposures to soils exceeded the 1x 10^{-5} target risk level. Assessed non-residential scenarios included the on-site worker and on-site construction worker exposure to surface and subsurface soil. The only on-site soil COI, vinyl chloride, does not have non-carcinogenic toxicity constants. Therefore, no soil non-carcinogenic hazard indices for non-residential exposures were estimated. On-site soil COI concentrations found do not appear to pose a significant human health threat. No off-site soil COI were identified that required assessment.

- Based on the noted exceedances of the Tier II Residential Goals at property boundaries and/or at off-site locations, it is apparent that potentially unacceptable risks are posed by potential direct contact (ie ingestion) groundwater exposures to off-site residents in the immediate vicinity south and east of the subject site. However, an evaluation of volatilized vapor from groundwater to indoor air using data from well MW-157 posed no significant human health threat for offsite residents. The only known water well in the site area was sampled by the MCHD on January 2, 1997 and the sample did not contain any detectable VOC concentrations. No on-site groundwater COI were identified that required assessment.

- The surface water non-carcinogenic risks were below the EPA's target hazard index of 1.0. Cis-1,2-dichloroethene, the only surface water COI, does not have carcinogenic toxicity constants. Therefore, no surface water carcinogenic risk levels were estimated. Off-site surface water COI concentrations found do not appear to pose a significant human health threat.

7.0 RECOMMENDATIONS

- TCE occurrence in groundwater has not been delineated southeast of the site. Additional wells should be and are planned to be installed south and east of MW-157.

- Based on the findings of the Remedial Investigation some potential unacceptable risks are posed by groundwater exposures to off-site residents in the immediate vicinity south and east of the subject site. Site specific cleanup goals need to be determined for VOCs occurrence in groundwater to mitigate the potential offsite risks. The cleanup goals will be used to determine the need for remediation (if warranted) and the type of technologies to be employed.

- Asbestos occurrence in the northwestern portion of the site has not been fully investigated. Additional investigation activities are planned in this area to identify the magnitude and extent of asbestos occurrence.

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TABLE 1
SUMMARY OF DETECTED VOCs CONCENTRATIONS IN SOIL
HISTORICAL DATA
GENERAL MOTORS - ALLISON PLANT 10

BORING ID	SAMPLE DATE	SAMPLE DEPTH (feet)	SAMPLE ANALYTICAL RESULT						
			VINYL CHLORIDE	TETRA-CHLORO-ETHENE	TOTAL-1,2-DICHLORO-ETHENE	TRICHLORO-ETHENE	METHYLENE CHLORIDE	TOLUENE	TOTAL XYLENES
SB-132[1]	9/92	8-10	<6300	<3100	12000	**120000**	<3100	<3100	<3100
SB-133[1]	9/92	3-5	<1300	<630	<630	14000	<630	<630	<630
SB-134[1]	9/92	8-10	<10	<5	<5	<5	<5	<5	<5
SB-135[1]	9/92	8-10	<10	<5	<5	<5	<5	<5	<5
		DUPL	<10	<5	<5	<5	<5	<5	<5
SB-145[1]	5/93	13-15	<500	<100	1200	<100	<1000	<100	<100
		DUPL	<500	<100	<600	<100	<1000	<100	<100
		28-30	<10	<5	<5	<5	18	<5	<5
SB-146[1]	5/93	13-15	<10	<5	<5	93	12	<5	<5
		23-25	<10	13	<5	<5	15	8	<5
SB-147[1]	5/93	8-10	<500	<100	1000	23000	<1000	<100	<100
		28-30	<10	<5	<5	<5	<21	<24	<5
SB-148[1]	5/93	8-10	<500	<100	900	14000	<1000	<100	<100
		23-25	<10	<5	15	14	<10	12	<5
SB-149[1]	5/93	8-10	<500	<100	1400	200	<1000	<100	<100
SB-150[1]	5/93	3-5	500	700	<100	4200	<1000	<100	<400
		8-10	<500	<100	1800	300	<100	<100	<100
SB10-1[2]	3/94	2-4	<1	<1	4	45	NA	<1	<3
SB10-2[2]	3/94	6-8	<5	<5	490	29	NA	<5	<16
SB10-3[2]	3/94	4-6	<1	<1	71	<1	NA	<1	<3
SB10-4[2]	3/94	6-8	<120	<120	<120	<120	NA	<120	1300
SB10-5[2]	3/94	14-16	<120	<120	<120	2500	NA	<120	<360
MW10-1[2]	3/94	10-12	<110	<110	<110	3800	NA	<110	<330
TIER II NON- RESIDENTIAL GOALS			130	8,010	102,490	25,730	not determined	1,000,000	1,000,000
TIER II RESIDENTIAL GOALS			130	230	17,140	80	not determined	202,160	1,000,000

NOTES: Analytical results are in ug/kg: parts per billion (ppb).
1) Samples collected by ESI.
2) Samples collected by OBG.
Bolded values are greater than Tier II non-residential goals.

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TABLE 1B
SUMMARY OF METAL CONCENTRATIONS IN SOIL
HISTORICAL DATA
GENERAL MOTORS - ALLISON PLANT 10

BORING ID	SAMPLE DEPTH (feet)	PRIORITY POLLUTANT METALS (mg/kg)							
		Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
SB10-1	2-4	8.4	290	8	39	1000	0.1	1.6	<1
SB10-2	6-8	4.6	19	<1	6	9.4	<1	2.1	<1
SB10-3	4-6	3.6	26	<1	9	5.4	0.1	2.3	<1
SB10-4	6-8	7.2	83	<1	22	13	<0.1	<0.6	<1
SB10-5	14-16	2.1	<11	<1	4	3.9	<0.1	3.3	<1
MW10-1	10-12	3.4	<11	<1	6	4.6	0.1	2.1	<1
TIER II NON-RESIDENTIAL GOALS		438	10000	730	10000/7300	NA	87.60	7300	7300
TIER II RESIDENTIAL GOALS		438	10000	730	10000/7300	NA	87.60	7300	7300

NOTES: Analytical results are in mg/kg: parts per million (ppm).
Samples collected by Fluor Daniel GTI, Inc.

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TABLE 2
SUMMARY OF WELL AND CREEK GAUGING DATA
GENERAL MOTORS - ALLISON PLANT 10

WELL ID	TOC ELEV. (FEET)	SCREEN INTERVAL (FEET)	DATE GAUGED	DTW (FEET)	GROUNDWATER ELEV. (FEET)
MW-10-1	714.04	7-17	7/14/95	14.07	699.97
			9/11/95	14.25	699.79
			2/5/97	12.75	701.29
MW-132	712.17	10-20	7/14/95	11.39	700.78
			9/11/95	11.49	700.68
			2/5/97	10.25	701.92
			2/26/97	11.17	701.00
MW-133	708.79	8-18	9/11/95	8.84	699.95
			2/5/97	7.29	701.50
MW-135	713.69	10-20	7/14/95	13.26	700.43
			9/11/95	13.66	700.03
			2/5/97	11.96	701.73
			2/26/97	12.47	701.22
MW-145	707.90	18-28	7/14/95	8.85	699.05
			9/11/95	8.85	699.05
			2/5/97	7.43	700.47
MW-146	708.67	15-25	7/14/95	9.41	699.26
			9/11/95	9.44	699.23
			2/5/97	7.95	700.72
MW-147	711.88	20-30	7/14/95	11.09	700.79
			9/11/95	11.20	700.68
			2/5/97	9.91	701.97
MW-148	711.00	10.5-25.5	7/14/95	10.43	700.57
			9/11/95	10.50	700.50
			2/5/97	8.25	702.75
			2/26/97	10.15	700.85
MW-150	712.93	4-19	9/11/95	13.30	699.63
			2/5/97	11.75	701.18
MW-151	712.96	5-20	7/14/95	13.93	699.03
			9/11/95	14.04	698.92
			2/5/97	12.80	700.16
MW-152	713.06	5-20	7/14/95	13.45	699.61
			9/11/95	13.57	699.49
			2/5/97	12.21	700.85
			2/26/97	12.92	700.14

95824kg

TABLE 2
SUMMARY OF WELL AND CREEK GAUGING DATA
GENERAL MOTORS - ALLISON PLANT 10

WELL ID	TOC ELEV. (FEET)	SCREEN INTERVAL (FEET)	DATE GAUGED	DTW (FEET)	GROUNDWATER ELEV. (FEET)
MW-153	711.64	4.5-19.5	7/14/95	11.77	699.87
			9/11/95	11.76	699.88
			2/5/97	9.78	701.86
			2/26/97	11.14	700.50
MW-154	714.22	5-20	7/14/95	13.31	700.91
			9/11/95	13.42	700.80
			2/5/97	12.17	702.05
			2/26/97	13.07	701.15
MW-155	717.52	14-29	9/11/95	16.78	700.74
			2/5/97	15.71	701.81
			2/26/97	16.70	700.82
MW-156	711.69	5-20	9/11/95	12.21	699.48
			2/5/97	10.65	701.04
MW-157	711.30	5-20	2/5/97	10.71	700.59
			2/26/97	11.14	700.16
MW-158	720.05	14-29	2/5/97	17.95	702.10
			2/26/97	19.14	700.91
MW-200	713.03	45-50	7/14/95	14.20	698.83
			2/5/97	11.96	701.07
MW-201	712.29	36-38	7/14/95	13.15	699.14
			9/11/95	12.99	699.30
			2/5/97	11.65	700.64
			2/26/97	12.12	700.17
MW-202	711.88	33-35	7/14/95	22.78	689.10
			9/11/95	12.33	699.55
			2/5/97	11.20	700.68
			2/26/97	12.29	699.59
MW-301	712.75	45-50	2/5/97	11.75	701.00
MW-302	711.54	45-55	2/5/97	11.26	700.28
			2/26/97	12.33	699.21
Holt Gauge	702.57	N/A	2/26/97		
Olin Gauge	698.75	N/A	2/26/97		

NOTES: TOC ELEV. - Elevation at the top of the PVC well casing relative to the on-site datum.
DTW. - Depth to groundwater in feet.
GROUNDWATER ELEV. - Elevation of groundwater in the well using the depth to water.

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TABLE 5
SUMMARY OF SOIL VAPOR HEADSPACE READINGS
GENERAL MOTORS - ALLISON PLANT 10

SAMPLE DEPTH (FEET)	PID READING (PPMV)																	
	MW-152	MW-154	MW-155	MW-156	MW-157	MW-158	MW-200	MW-201	MW-202	MW-301	MW-302	GP-1	GP-2	GP-3	GP-4	GP-5	SP-1	HP-1
0-2	--	--	--	--	--	--	--	--	--	--	--	4.6	4.6	15	1.3	2.8	--	--
3-5	0.0	3.8	0.0	0.4	1.8*	250	0.0	0.0	0.0	--	--	--	--	--	--	--	0.0	0.0*
5-7	--	--	--	--	--	--	--	--	--	--	--	5.2	24	44	2.0	2.0	--	--
8-10	0.0*	3.9*	0.0	0.5	--	>1000*	--	0.0	0.0	--	--	--	--	--	--	--	2.2	--
9-11	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--	--	--
10-12	--	--	--	--	--	--	--	--	--	--	--	52	17	2.5	3.0	6.4	--	--
13-15	0.0	2.2	200*	0.4	6.0	150	2.0*	0.0	14.8*	--	--	--	--	--	--	--	9.2	--
18-20	7.5*	3.2*	85	1.0*	6.9	102	0.0	8.4*	8.2	--	--	--	--	--	--	--	8.0	--
23-25	--	--	1.0	--	--	4.0	1.0	0.0	0.2	--	--	--	--	--	--	--	0.0	--
28-30	--	--	7.0*	--	--	3.5	0.0	5.8	0.0	--	--	--	--	--	--	--	--	--
33-35	--	--	--	--	--	--	1.4	0.0	0.0*	--	--	--	--	--	--	--	--	--
38-40	--	--	--	--	--	--	0.2	0.0*	--	--	28	--	--	--	--	--	--	--
43-45	--	--	--	--	--	--	0.7	--	--	9.0	160	--	--	--	--	--	--	--
45-47	--	--	--	--	--	--	--	--	--	6.4	--	--	--	--	--	--	--	--
47-49	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--
48-50	--	--	--	--	--	--	0.0*	--	--	--	540*	--	--	--	--	--	--	--
49-51	--	--	--	--	--	--	--	--	--	9.2	--	--	--	--	--	--	--	--
53-55	--	--	--	--	--	--	--	--	--		180	--	--	--	--	--	--	--
58-60	--	--	--	--	--	--	--	--	--		300	--	--	--	--	--	--	--
63-65	--	--	--	--	--	--	--	--	--	--	200*						--	--

NOTES: PPMV - Parts per million by volume
-- - No sample at this depth.
* - Sample collected for laboratory analysis.

FLUOR DANIEL GTI

95824kg

TABLE 6
SUMMARY OF VOCs CONCENTRATIONS IN SOIL FOR WELLS AND BORINGS INSTALLED BY FLUOR DANIEL GTI
EPA METHOD 8240
GENERAL MOTORS - ALLISON PLANT 10

BORING ID	SAMPLE DEPTH (feet)	DATE SAMPLED	VINYL CHLORIDE	cis-1,2-DICHLORO-ETHENE	trans-1,2-DICHLORO-ETHENE	TRICHLORO-ETHENE	TETRACHLORO-ETHENE
MW-152	8-10	6/27/95	<10	<5	<5	300	<5
	18-20	6/28/95	<10	<5	<5	<5	<5
MW-154	8-10	6/29/95	<10	<5	<5	<5	<5
	18-20		<10	<5	<5	<5	<5
MW-155	13-15	9/5/95	60	3500	<5	390	<5
	28-30		<10	<5	<5	<5	<5
MW-156*	18-20	9/5/95	<10	<5	<5	**170**	14
MW-157	3-5	1/23/97	<10	<5	<5	<5	<5
MW-158	8-10	1/23/97	<10	<5	<5	<5	<5
MW-200	13-15	7/10/95	<10	33	<5	260	18
	48-50	7/14/95	<10	<5	<5	<5	<5
MW-201*	18-20	7/11/95	<10	90	11	<5	<5
	38-40	7/11/95	<10	<5	<5	<5	<5
MW-202	13-15	7/11/95	24	1100	<5	8300	<5
	33-35	7/11/95	<10	<5	<5	6.8	<5
MW-302	48-50	1/31/97	<10	<5	<5	<5	<5
	63-65		<10	<5	<5	<5	<5
GP-1	5-7	12/19/96	40	2700	25	12000	<5
GP-2	5-7	12/19/96	<10	130	<5	<5	<5
GP-3	5-7	12/19/96	12	<5	<5	<5	<5
GP-4	5-7	12/19/96	<10	<5	<5	77	<5
GP-5	5-7	12/19/96	<10	<5	<5	180	<5
GP-6	5-7	12/19/96	<10	<5	<5	41	<5
HP-1*	3-5	9/6/95	<10	40	<5	<5	17
TIER II NON-RESIDENTIAL GOALS			130	102,490	not determined	25,730	8,010
TIER II RESIDENTIAL GOALS			130	17,140	not determined	80	230

NOTES: Analytical results are in ug/kg: parts per billion (ppb).
Samples collected by Fluor Daniel GTI, Inc.
MW wells were analyzed using EPA Method 8240.
* - Located off-site to the south or southeast. Considered potential residential exposure.
Bolded value (MW156) indicates well of concern.

TABLE 6B
SUMMARY OF DETECTED PRIORITY POLLUTANT METAL CONCENTRATIONS IN SOIL FOR GEOPROBE BORINGS INSTALLED BY FLUOR DANIEL GTI
DECEMBER 19, 1996
EPA METHOD 6010
GENERAL MOTORS - ALLISON PLANT 10

BORING ID	SAMPLE DEPTH (feet)	PRIORITY POLLUTANT METALS (mg/kg)						
		Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
GP-1	0-2	<0.5	<2	5.5	9.0	21	7.7	39
GP-2	0-2	<0.5	4.1	1600	510	940	28	880
GP-3	0-2	0.61	<2	16	21	9.0	21	60
GP-4	0-2	<0.5	<2	10	12	10	12	42
GP-5	0-2	<0.5	<2	9.7	7.4	13	8.5	36
GP-6	0-2	<0.5	<2	17	14	8.6	17	37
TIER II NON-RESIDENTIAL GOALS		13.49	1020	10000	not determined	NA	10000	10000
TIER II RESIDENTIAL GOALS		0.5	135	1350 or 10000	not determined	NA	5400	10000

NOTES: Analytical results are in mg/kg: parts per million (ppm)
Samples collected by Fluor Daniel GTI, Inc.

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TABLE 7
SUMMARY OF VOCs CONCENTRATIONS IN GROUNDWATER FOR MONITORING WELLS -HISTORICAL DATA
EPA METHOD 8240
GENERAL MOTORS - ALLISON PLANT 10

SAMPLE ID	SAMPLE DATE	SAMPLE ANALYTICAL RESULT				
		VINYL CHLORIDE	11-DICHLORO-ETHANE	trans-1,2-DICHLORO-ETHENE	cis-1,2-DICHLORO-ETHENE	TRICHLORO-ETHENE
MW-10-1	3/28/94	<100	<100	160		880
	10/5/94	–	–	–	–	1600
	7/14/95	<10	<5	5.9	190	1800
	2/5/97	<10	<5	<5	120	810
MW-132	9/92	1200	<50	1500		280
	5/93	<100	<20	2400		1900
	7/14/95	600	<5	15	5100	1700
	2/5/97	<250	<120	<120	65000	15000
MW-133	9/92	<10	<5	81		47
	5/93	5.3	<1	56		24
	9/11/95	<10	<5	<5	70	23
	2/5/97	<10	<5	<5	100	53
MW-135	9/92	<10	<5	<5		<5
	5/93	<5	<1	<1		<1
	7/14/95	<10	<5	<5	<5	<5
	2/5/97	<10	<5	<5	<5	<5
MW-145	5/93	<20	<5	440		9
	7/14/95	12	<5	<5	530	5.6
	2/5/97	<10	<5	<5	<5	43
MW-146	5/93	<5	<1	<1		83
	7/14/95	<10	<5	<5	<5	52
	2/5/97	<10	<5	<5	<5	43
MW-147	5/93	42	<1	<140		39
	7/14/95	<10	<5	<5	<5	<5
	2/5/97	<10	<5	<5	95	51
MW-148	5/93	490	<80	19000		4900
	7/14/95	92	23	1400	12	410
	2/5/97	<10	<5	<5	73	<5
MW-150	7/17/95	<10	<5	<5	6.7	65
	2/5/97	<10	<5	<5	<5	86
MW-151*	7/14/95	<10	<5	7.4	74	<5
	2/6/97	<10	<5	<5	20	<5
MW-152	7/14/95	<10	<5	<5	5.3	150
	2/5/97	<10	<5	<5	<5	150

TABLE 7
SUMMARY OF VOCs CONCENTRATIONS IN GROUNDWATER FOR MONITORING WELLS -HISTORICAL DATA EPA METHOD 8240 GENERAL MOTORS - ALLISON PLANT 10

SAMPLE ID	SAMPLE DATE	SAMPLE ANALYTICAL RESULT				
		VINYL CHLORIDE	11-DICHLORO-ETHANE	trans-1,2-DICHLORO-ETHENE	cis-1,2-DICHLORO-ETHENE	TRICHLORO-ETHENE
MW-153	7/14/95	**22**	<5	<5	960	**570**
	2/6/97	<10	<5	<5	<5	5.4
MW-153 DUPL	2/6/97	<10	<5	<5	<5	<5
MW-154	7/14/95	<10	<5	<5	<5	<5
	2/5/97	<10	<5	<5	<5	<5
MW-155	9/11/95	**240**	<5	<5	180	<5
	2/6/97	**3400**	<500	<500	**17000**	<500
MW-156*	9/11/95	<10	<5	<5	30	**280**
	2/6/97	<10	<5	<5	7.5	**52**
MW-156* DUPL	2/6/97	<10	<5	<5	6.9	**50**
MW-157*	2/6/97	<100	<50	<50	<50	**60**
	2/26/97	<10	<5	<5	<5	**100**
MW-158	2/6/97	<10	<5	<5	<5	<5
MW-200	7/17/95	<10	<5	<5	<5	<5
	2/5/97	<10	<5	<5	<5	<5
MW-201*	7/14/95	<10	<5	<5	<5	<5
	2/6/97	<10	<5	<5	<5	<5
MW-202	7/14/95	<10	<5	<5	<5	<5
	2/6/97	<10	<5	<5	<5	<5
MW-301	2/6/97	<10	<5	<5	<5	<5
MW-302	2/6/97	<10	<5	<5	8.2	<5
HP-1*	9/6/95	**500**	<5	12	**3900**	**430**
TRIP BLANK	7/14/95	<10	<5	<5	<5	<5
	2/6/97	<10	<5	<5	<5	<5
EQUIPMENT BLANK	7/14/95	<10	<5	<5	<5	<5
	2/6/97	<10	<5	<5	<5	<5
TIER II NON-RESIDENTIAL GOALS		10	10,200	not determined	1,022	260
TIER II RESIDENTIAL GOALS		2	640	not determined	70	5

NOTES: Unit of data is ug/L.
9/92 & 5/93 Data collected by Engineering Science, Inc.
3/94 & 10/94 Data collected by O'Brien & Gere Engineers, Inc.
7/95, 9/95, & 2/97 Data collected by Fluor Daniel GTI, Inc.
Bolded values are greater than respective Tier II goals.
* - Located off-site to the south or southeast. Considered potential residential exposure.

TABLE 7B
SUMMARY OF VOCs CONCENTRATIONS IN SURFACE WATER FROM LITTLE EAGLE CREEK
EPA METHOD 8240
GENERAL MOTORS - ALLISON PLANT 10

SAMPLE ID	SAMPLE DATE	SAMPLE ANALYTICAL RESULT			
		VINYL CHLORIDE	cis-1,2-DICHLORO-ETHENE	TRICHLORO-ETHENE	METHYLENE CHLORIDE
ST-1	10/4/96	<10	<5	<5	<5
	2/10/97	<10	<5	<5	<5
ST-2	10/4/96	<10	17	<5	<5
	2/10/97	<10	<5	<5	<5
ST-2 DUPL	2/10/97	<10	<5	<5	<5
ST-3	10/4/96	<10	14	<5	<5
	2/10/97	<10	<5	<5	<5
Equipment Blank	2/10/97	<10	<5	<5	8.3
Trip Blank	10/4/96	<10	<5	<5	5*
TIER II NON-RESIDENTIAL GOALS		10	1,022	260	
TIER II RESIDENTIAL GOALS		2	70	5	

NOTES: Unit of data is ug/L.
Data collected by Fluor Daniel GTI, Inc.
Tier II goals listed are for groundwater.
* Methylene Chloride was detected in the method blank at 5.9 ug/L.

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Table 8

General Motors - Allison Gas Plant 10
Little Eagle Creek Flow Summary

Summary of Little Eagle Creek Discharge Data

Location	Flow (cfs)	
	October 1996	February 1997
Upstream	4 *	20.88
Midpoint	8	23.77
Downstream	4 *	23.58

* indicates stream flow was too low to measure and was estimated

Little Eagle Creek at Speedway Gaging Station

	Flow (cfs)	
	October	February
Max	88.9	75.5
Min	0.81	3.82
Mean	11.1	30.4

Notes:
(1) Gaging period: 1965 - 1995
(2) Gaging station located approx. 1.2 miles upstream from site

TABLE 9
SUMMARY OF SOIL LITERATURE BACKGROUND RANGES FOR TIER I METALS EVALUATIONS GENERAL MOTORS - ALLISON PLANT 10

Analyte	Range of Background Results	Mean	Number of Samples In Background Range
Arsenic	3.6 - 15	7.5	11
Barium	300 - 700	500	11
Beryllium	ND - 2	0.36	11
Cadmium	N/A	1.15	60
Chromium	15 - 70	47	11
Copper	15 - 70	27	11
Lead	ND - 30	18	11
Mercury	0.04 - 0.26	0.109	11
Nickel	7 - 30	18	11
Selenium	ND - 0.5	0.35	11
Silver	ND - 5 *	--	1319
Zinc	32 - 113	56	11

Notes:

- All background concentrations are in units of mg/Kg.

- All literature values were taken from Elements in North American Soils (Dragun, 1991)

- Cadmium data were obtained from a source that did not provide a concentration range.

-'' Signifies a State of Indiana value was not available. Therefore, the background value for the conterminous USA was reported.*

- ND indicates the lower range of the background was nondetected concentrations.

TABLE 10
SOIL FREQUENCY AND STATISTICAL SUMMARY
ON-SITE VADOSE ZONE SUBSURFACE SOIL DATA
GENERAL MOTORS-ALLISON PLANT 10

ID		SB-132 (E)	SB-133 (E)	SB-134 (E)	SB-135 (E)	SB-147 (E)	SB-148 (E)
DEPTH		8-10	3-5	8-10	8-10	8-10	8-10
DATE		9/92	9/92	9/92	9/92	5/93	5/93
	UNIT						
Vinyl Chloride	ug/Kg	3150 U	650 U	5 U	5 U	250 U	250 U
Tetrachloroethene	ug/Kg	1550 U	315 U	2.5 U	2.5 U	50 U	50 U
Total-1,2-Dichloroethene	ug/Kg	12000	315 U	2.5 U	2.5 U	1000	900
Trichloroethene	ug/Kg	120000	14000	2.5 U	2.5 U	23000	14000
Toluene	ug/Kg	1550 U	315 U	2.5 U	2.5 U	50 U	50 U
Total Xylenes	ug/Kg	1550 U	315 U	2.5 U	2.5 U	50 U	50 U

ID		SB-149 (E)	SB-150 (E)	SB-150 (E)	SB10-1 (O)	SB10-2 (O)	SB10-3 (O)
DEPTH		8-10	3-5	8-10	2-4	6-8	4-6
DATE		5/93	5/93	5/93	3/94	3/94	3/94
	UNIT						
Vinyl Chloride	ug/Kg	250 U	500	250 U	0.5 U	2.5 U	0.5 U
Tetrachloroethene	ug/Kg	50 U	700	50 U	0.5 U	2.5 U	0.5 U
Total-1,2-Dichloroethene	ug/Kg	1400	50 U	1800	4	490	71
Trichloroethene	ug/Kg	200	4200	300	45	29	0.5 U
Toluene	ug/Kg	50 U	50 U	50 U	0.5 U	2.5 U	0.5 U
Total Xylenes	ug/Kg	50 U	200 U	50 U	1.5 U	8 U	1.5 U

TABLE 10
SOIL FREQUENCY AND STATISTICAL SUMMARY
ON-SITE VADOSE ZONE SUBSURFACE SOIL DATA
GENERAL MOTORS-ALLISON PLANT 10

ID		SB10-4 (O)	MW-152	MW-154	GP-1	GP-2	GP-3
DEPTH		6-8	8-10	8-10	5-7	5-7	5-7
DATE		3/94	6/27/95	6/29/95	12/19/96	12/19/96	12/19/96
	UNIT						
Vinyl Chloride	ug/Kg	60 U	5 U	5 U	40	5 U	12
Tetrachloroethene	ug/Kg	60 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total-1,2-Dichloroethene	ug/Kg	60 U	2.5 U	2.5 U	2725	130	2.5 U
Trichloroethene	ug/Kg	60 U	300	2.5 U	12000	2.5 U	2.5 U
Toluene	ug/Kg	60 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Total Xylenes	ug/Kg	1300	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U

ID		GP-4	GP-5	GP-6
DEPTH		5-7	5-7	5-7
DATE		12/19/96	12/19/96	12/19/96
	UNIT			
Vinyl Chloride	ug/Kg	5 U	5 U	5 U
Tetrachloroethene	ug/Kg	2.5 U	2.5 U	2.5 U
Total-1,2-Dichloroethene	ug/Kg	2.5 U	2.5 U	2.5 U
Trichloroethene	ug/Kg	77	180	41
Toluene	ug/Kg	2.5 U	2.5 U	2.5 U
Total Xylenes	ug/Kg	2.5 U	2.5 U	2.5 U

TABLE 10
SOIL FREQUENCY AND STATISTICAL SUMMARY
ON-SITE VADOSE ZONE SUBSURFACE SOIL DATA
GENERAL MOTORS-ALLISON PLANT 10

ID DEPTH DATE	UNIT	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION	ARITHMETIC MEAN *	STANDARD DEVIATION *	NORMAL UPPER 95% CONFIDENCE INTERVAL *
Vinyl Chloride	ug/Kg	12	500	SB-150 (E)	3/21	115.3	186.7	187.5
Tetrachloroethene	ug/Kg	700	700	SB-150 (E)	1/21	135.9	361.8	272.1
Total-1,2-Dichloroethene	ug/Kg	4	12000	SB-132 (E)	10/21	998.3	2625.6	1986.7
Trichloroethene	ug/Kg	29	120000	SB-132 (E)	14/21	8973.6	26260.1	18858.6
Toluene	ug/Kg	ND	ND		0/21	104.9	338.1	NA
Total Xylenes	ug/Kg	1300	1300	SB10-4 (O)	1/21	171.5	425.7	331.7

Note: (*) The statistics calculated for vinyl chloride are based on the entire data set excluding the significant elevated detection limit reported for soil sample SB-132 as even the half-detection limit value of 3100 ug/kg is more than six times greater than the maximum detected concentration of 500 ug/kg in soil sample SB-150 and is not representative of the remaining data set. The exclusion of this data point has been done in accordance with EPA guidance from Section 5.3.2 of RAGS, Part A, Interim Final (1989a).

ID DEPTH DATE	UNIT
Vinyl Chloride	ug/Kg
Tetrachloroethene	ug/Kg
Total-1,2-Dichloroethene	ug/Kg
Trichloroethene	ug/Kg
Toluene	ug/Kg
Total Xylenes	ug/Kg

TABLE 11
SOIL FREQUENCY AND STATISTICAL SUMMARY
OFF-SITE VADOSE ZONE SUBSURFACE SOIL DATA
GENERAL MOTORS-ALLISON PLANT 10

ID		MW-157	MW-158	HP-1
DEPTH		3-5	8-10	3-5
DATE		1/23/97	1/23/97	9/6/95
	UNITS			
Vinyl Chloride	ug/Kg	5 U	5 U	5 U
Tetrachloroethene	ug/Kg	2.5 U	2.5 U	17
Total-1,2-Dichloroethene	ug/Kg	2.5 U	2.5 U	40
Trichloroethene	ug/Kg	2.5 U	2.5 U	2.5 U
Toluene	ug/Kg	2.5 U	2.5 U	2.5 U
Total Xylenes	ug/Kg	2.5 U	2.5 U	2.5 U

		MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION	ARITHMETIC MEAN	STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL
	UNITS							
Vinyl Chloride	ug/Kg	ND	ND	--	0/3	NA	NA	NA
Tetrachloroethene	ug/Kg	17	17	HP-1	1/3	7	8	13
Total-1,2-Dichloroethene	ug/Kg	40	40	HP-1	1/3	15	22	30
Trichloroethene	ug/Kg	ND	ND	--	0/3	NA	NA	NA
Toluene	ug/Kg	ND	ND	--	0/3	NA	NA	NA
Total Xylenes	ug/Kg	ND	ND	--	0/3	NA	NA	NA

TABLE 12
SURFACE AND SUBSURFACE SOIL LEAD & ASBESTOS
STATISTICAL EVALUATIONS
GENERAL MOTORS - ALLISON PLANT 10

Surface Lead Results (mg/kg)

Location	Depth	Concentration
GP-1	0-2'	21
GP-2	0-2'	940
GP-3	0-2'	9
GP-4	0-2'	10
GP-5	0-2'	13
GP-6	0-2'	8.6

Average	167
Std Dev	379
95% UCL	479

Subsurface Lead Results (mg/kg)

Location	Depth	Concentration
SB10-1	2-4'	1000
SB10-2	6-8'	9.4
SB10-3	4-6'	5.4
SB10-4	6-8'	13
SB10-5	14-16'	3.9
MW10-1	10-12'	4.8

Average	173
Std Dev	405
95% UCL	506

Surface Asbestos Results (%)

Location	Depth	Concentration
SS10-1	0-1'	10%
SS10-2	0-1'	10%

Subsurface Asbestos Results (%)

Location	Depth	Concentration
SB10-1	2-4'	8%
SB10-2	6-8'	<1%
SB10-3	4-6'	<1%
SB10-4	6-8'	<1%
SB10-5	14-16'	<1%
MW10-1	10-12'	<1%

TABLE 13
GROUNDWATER FREQUENCY SUMMARY
ON-SITE AND OFF-SITE GROUNDWATER DATA
GENERAL MOTORS-ALLISON PLANT 10

ID		MW-10-1	MW-132	MW-133	MW-135	MW-145	MW-146
DATE		2/5/97	2/5/97	2/5/97	2/5/97	2/5/97	2/5/97
	UNIT						
Vinyl Chloride	ug/L	5 U	125 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	2.5 U	60 U	2.5 U	2.5 U	2.5 U	2.5 U
cis-1,2-Dichloroethene	ug/L	120	65000	100	2.5 U	2.5 U	2.5 U
Trichloroethene	ug/L	810	15000	53	2.5 U	43	43

ID		MW-147	MW-148	MW-150	MW-151 *	MW-152	MW-153
DATE		2/5/97	2/5/97	2/5/97	2/6/97	2/5/97	2/6/97
	UNIT						
Vinyl Chloride	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
cis-1,2-Dichloroethene	ug/L	95	73	2.5 U	20	2.5 U	2.5 U
Trichloroethene	ug/L	51	2.5 U	86	2.5 U	150	5.4

NOTE: '' Designates an off-site well southeast of the site where off-site potential exposures exist.*

TABLE 13
GROUNDWATER FREQUENCY SUMMARY
ON-SITE AND OFF-SITE GROUNDWATER DATA
GENERAL MOTORS-ALLISON PLANT 10

ID		MW-154	MW-155	MW-156 *	MW-157 *	MW-158	MW-200
DATE		2/5/97	2/6/97	2/6/97	2/26/97	2/6/97	2/5/97
	UNIT						
Vinyl Chloride	ug/L	5 U	3400	5 U	10 U	5 U	5 U
1,1-Dichloroethane	ug/L	2.5 U	250 U	2.5 U	5 U	2.5 U	2.5 U
cis-1,2-Dichloroethene	ug/L	2.5 U	17000	7.5	5 U	2.5 U	2.5 U
Trichloroethene	ug/L	2.5 U	250 U	52	100	2.5 U	2.5 U

ID		MW-201	MW-202	MW-301	MW-302	HP-1
DATE		2/6/97	2/6/97	2/6/97	2/6/97	9/6/95
	UNIT					
Vinyl Chloride	ug/L	5 U	5 U	5 U	5 U	500
1,1-Dichloroethane	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
cis-1,2-Dichloroethene	ug/L	2.5 U	2.5 U	2.5 U	8.2	3900
Trichloroethene	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	430

NOTES: '' Designates an off-site well southeast of the site where off-site potential exposures exist.*
Sample MW-157 was resampled on 2/26/97 due to a high detection limit for vinyl chloride in the sample collected on 2/6/97. The TCE concentration in this well represents the worst-case off-site groundwater concentration for parameters exceeding the IDEM residential land use health-based criteria for groundwater.

TABLE 13
GROUNDWATER FREQUENCY SUMMARY
ON-SITE AND OFF-SITE GROUNDWATER DATA
GENERAL MOTORS-ALLISON PLANT 10

ID DATE	UNIT	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
Vinyl Chloride	ug/L	500	3400	MW-155	2/23
1,1-Dichloroethane	ug/L	ND	ND		0/23
cis-1,2-Dichloroethene	ug/L	7.5	65000	MW-132	10/23
Trichloroethene	ug/L	5.4	15000	MW-132	12/23

ID DATE	UNIT
Vinyl Chloride	ug/L
1,1-Dichloroethane	ug/L
cis-1,2-Dichloroethene	ug/L
Trichloroethene	ug/L

TABLE 14

CALCULATION OF SOIL-TO-AIR VOLATILIZATION FACTOR AND PARTICULATE EMISSIONS FACTOR FOR USE IN DETERMINING INHALATION OF VOLATILES FROM SOILS EXPOSURES GENERAL MOTORS - ALLISON PLANT 10

Input Paramet	Abbrev.	Value	Units	Source
LENGTH OF AREA	LS	250	m	Estimated
WIND SPEED -MIX ZONE	V	2.25	m/sec	Default
DIFFUSION HEIGHT	DH	2	m	Default
AREA IMPACTED	A	150,000,000	cm^2	Estimated
SOIL POROSITY	E	0.35	unitless	Default
FRACTION OF VEGETATIVE COVER	G	0.95	unitless	Estimated
EFFECTIVE DIFFUSIVITY	Dei	Di * E^0.33	cm^2/sec	Default
SOIL/AIR PARTITION	Kas	H/Kd * 41	g soil/cm^3 air	Default
PARTICULATE DENSITY	Ps	2.65	g/cm^3	Default
EXPOSURE INTERVAL	T	7.9E+08	sec	Default (25 yrs)
MOLECULAR DIFFUSIVITY	Di	chem-spec	cm^2/sec	Lookup
HENRY'S LAW CONSTANT	H	chem-spec	atm-m^3/mol	Lookup
SOIL-WATER PARTITION	Kd	chem-spec	cm^3/g	Koc x OC
ORGANIC CARBON PARTITION	Koc	chem-spec	cm^3/g	Lookup
ORGANIC CARBON CONTENT	OC	0.02	unitless	Default
RESPIRABLE FRACTION	RF	0.036	g/m^2-hr	Default
MEAN ANNUAL WIND SPEED	Um	4.5	m/sec	Default
THRESHOLD WIND SPEED @ 10 M	Ut	18	m/sec	Estimated

Formulae ==> alpha (cm^2/sec) = (Dei x E) / [E + (Ps) * (1-E) / Kas]
VF (m^3/Kg) = [(LS * V * DH) / A] * [(3.14 * alpha * T)^0.5 / (2 * Dei * E * Kas *10^-3 kg/g)]
PEF (m^3/Kg) = [(LS * V *DH *3600) / A] * [(1000 g/Kg / (.036 * (1-G) * (Um/Ut)^3 * F(x))]

	VF Intermediate Calculated Inputs						Outputs		
Constituent	Dei	Kas	Di	H	Kd	Koc	alpha	VF	PEF
Vinyl Chloride	7.50E-02	3.08E+00	1.06E-01	8.42E-02	1.12E+00	56	2.89E-02	392	1.70E+12

Note: Most chemical-specific input values were taken from the Technical Background Document for Soil Screening Guidance, Review Draft. EPA/540/R-94/106. The Koc value was estimated using Equation 4-5 from the Handbook of Chemical Property Estimation Methods (Lyman et al. 1993).

TABLE 15

CALCULATION OF GROUNDWATER-TO-INDOOR AIR VOLATILIZATION CONCENTRATIONS FOR USE IN DETERMINING INHALATION OF VOLATILES FROM OFF-SITE GROUNDWATER EXPOSURES GENERAL MOTORS - ALLISON PLANT 10

Parameter	Definition	Units	Value	Basis
Site-Specific Parameters				
hcap	thickness of capillary fringe	cm	5	ASTM default
hv	thickness of vadose zone	cm	150	Site-specific
Vt	total soil porosity	cm^3/cm^3-soil	0.35	Default
p	soil particle density	g/cm^3	2.65	Default
pb	dry bulk density of soil	g/cm^3	1.45	Default
w	moisture content of soil	unitless	0.15	Estimated
Vacrack	volumetric air content in foundation walls/cracks	cm^3-air/cm^3 total volume	0.133	ASTM default
Vwcrack	volumetric water content in foundation walls/cracks	cm^3-water/cm^3 total volume	0.218	Vt-Vacrack
Vacap	volumetric air content in capillary fringe soils	cm^3-air/cm^3 soil	0.038	ASTM default
Vwcap	volumetric water content in capillary fringe soils	cm^3-water/cm^3 soil	0.312	Vt-Vacap
Vas	volumetric air content in vadose zone soils	cm^3-air/cm^3 soil	0.133	ASTM default
Vws	volumetric water content in vadose zone soils	cm^3-water/cm^3 soil	0.218	Vt-Vas
Lgw	depth to groundwater	cm	155	Site-specific
Lb	enclosed space volume/infiltration area ratio	cm	200	ASTM default
Lcrack	enclosed space foundation or wall thickness	cm	15	ASTM default
ER	enclosed space air exchange rate	L/sec	0.00014	ASTM default
n	areal fraction of cracks in foundation walls/cracks	cm^2-cracks/cm^2-total area	0.01	ASTM default
Chemical-Specific Parameters				
Dair	diffusion coefficient in air	cm^2/sec	chemical-specific	
Dwater	diffusion coefficient in water	cm^2/sec	chemical-specific	
H	Henry's Law Constant	cm^3-water/cm^3-air	chemical-specific	
Cwater	groundwater concentration	mg/L	chemical-specific	
Calculated Parameters				
Deffws	effective diffusion coefficient between groundwater and soil surface	cm^2/sec	chemical-specific	
Deffcap	effective diffusion coefficient through capillary fringe	cm^2/sec	chemical-specific	
Deffs	effective diffusion coefficient in soil based on vapor-phase concentration	cm^2/sec	chemical-specific	
Deffcrack	effective diffusion coefficient through foundation cracks	cm^2/sec	chemical-specific	
VFwesp	volatilization factor for groundwater to enclosed space vapors	(mg/m^3-air) / (mg/L-water)	chemical-specific	
Cair	air concentration	mg/m^3	chemical-specific	

Formulae

Deffws = (hcap + hv) / [hcap / Deffcap + hv / Deffs]

Deffcrack = Dair * Vacrack^3.33 / Vt^2 + (Dwater * Vwcrack^3.33) / (H * Vt^2)

Deffcap = Dair * Vacap^3.33 / Vt^2 + (Dwater * Vwcap^3.33) / (H * Vt^2)

Deffs = Dair * Vas^3.33 / Vt^2 + (Dwater * Vws^3.33) / (H * Vt^2)

VFwesp = H * [Deffws / (Lgw * ER * Lb)] * 10^3 L/m^3 / { 1 + [Deffws / (Lgw * ER * Lb)] + [(Deffws * Lcrack) / (Deffcrack * Lgw * n)] }

Cair = Cwater * VFwesp

Chemical	Dair	Dwater	H	Deffws	Deffcrack	Deffcap	Deffs	VFwesp	Cwater	Cair
Trichloroethene	0.079	9.10E-06	0.435	3.00E-04	7.71E-04	1.56E-05	7.71E-04	6.31E-03	0.10	6.31E-04

The Cair concentrations represent the estimated concentrations in air (from volatilized vapor) based on representative groundwater concentrations of the constituents of interest. The Cair values are then used to calculate an estimated risk from exposure to these estimated concentrations in air.

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TABLE 17

SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HUMAN HEALTH RISKS
INHALATION OF VOLATILES AND SOIL PARTICULATES AND INGESTION OF SITE SUBSURFACE SOILS
BASED ON RESULTS OF ON-SITE SUBSURFACE SOIL DATA
INDUSTRIAL NON-RESIDENTIAL EXPOSURES FOR ON-SITE WORKERS

CONSTITUENTS	PEF (m^3/Kg)	CF (10^-3 mg/ug)	VF (m^3/ Kg)	EF (d/yr)	ED (yrs)	IRair (m^3/ day)	BW (Kg)	AT Carc. (day)	AT Ncarc. (day)	INH Carc. CDI	INH Ncarc. CDI	CSF (Kg-d/ mg)	RfD (mg/ Kg-d)	INH ICR	INH HI
Vinyl Chloride	1.70E+12	1.00E-03	392	120	2	15	70	25550	730	9.65E-07	3.38E-05	0.3		2.90E-07	0.00E+00

INHALATION TOTAL ==> 2.90E-07 | 0.00E+00

CONSTITUENTS	IRsoil (mg/d)	EF (d/yr)	ED (yr)	BW (Kg)	AT Carc. (day)	AT Ncarc. (day)	CF 10^-9 Kg/ug	ING Carc. CDI	ING Ncarc. CDI	CSF (Kg-d/ mg)	RfD (mg/ Kg-d)	ING ICR	ING HI
Vinyl Chloride	100	120	2	70	25550	730	1.00E-09	2.52E-09	8.83E-08	1.9		4.79E-09	0.00E+00

INGESTION TOTAL = 4.79E-09 | 0.00E+00

TOTAL == 2.94E-07 | 0.00E+00

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TABLE 18

SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HUMAN HEALTH RISKS
INHALATION OF VOLATILES AND SOIL PARTICULATES AND INGESTION OF SITE SOILS
BASED ON RESULTS OF ON-SITE SUBSURFACE SOIL DATA
INDUSTRIAL NON-RESIDENTIAL EXPOSURES FOR ON-SITE CONSTRUCTION WORKERS

CDI inh = [(CW)(EF)(ED)(IRair)(CF)(1/VF + 1/PEF)]/[(BW)(AT)]
CDI ing = [(CW)(IRsoil)(CF)(EF)(ED)]/[(BW)(AT)]

WHERE:
CW = THE CHEMICAL CONCENTRATION (ug/Kg)
VF = SOIL TO AIR VOLATILIZATION FACTOR (m^3/Kg)
PEF = PARTICULATE EMISSION FACTOR (m^3/Kg)
EF = THE EXPOSURE FREQUENCY (d/yr)
ED = THE EXPOSURE DURATION (years)
CF = CONVERSION FACTOR (10^-9 Kg/ug or 10^-3 mg/ug)
BW = THE AVERAGE RECEPTOR BODY WEIGHT (Kg)
AT = THE AVERAGING TIME (ED (yrs) x 365d/yr)
IRair = THE AIR INGESTION RATE (m^3/d)
IRsoil = THE SOIL INGESTION RATE (mg/d)

ICR = SUM(CDIi * CSFi) (inhalation or ingestion)

HAZARD INDEX = SUM(CDIi / RfDi) (inhalation or ingestion)

TOTAL ICR = ICR inh + ICR ing

TOTAL HI = HI inh + HI ing

CDIi = CHRONIC DAILY INTAKE (per constituent)
inh = VIA INHALATION EXPOSURE
ing = VIA INGESTION EXPOSURE
HI = HAZARD INDEX (non-carcinogenic risks)
ICR = INCREMENTAL CANCER RISK (carcinogenic risks)
CSFi = CANCER SLOPE FACTOR (per constituent)
RfDi = REFERENCE DOSE (per constituent)

CONSTITUENTS	CW * (ug/Kg)	EPA WEIGHT OF EVIDENCE
Vinyl Chloride	188	A

* - The CW value for the on-site subsurface soils is the 95% UCL calculated for the 21 on-site vadose zone subsurface soil samples collected.

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TABLE 18

SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HUMAN HEALTH RISKS
INHALATION OF VOLATILES AND SOIL PARTICULATES AND INGESTION OF SITE SOILS
BASED ON RESULTS OF ON-SITE SUBSURFACE SOIL DATA
INDUSTRIAL NON-RESIDENTIAL EXPOSURES FOR ON-SITE CONSTRUCTION WORKERS

CONSTITUENTS	PEF (m^3/Kg)	CF (10^-3 mg/ug)	VF (m^3/ Kg)	EF (d/yr)	ED (yrs)	IRair (m^3/ day)	BW (Kg)	AT Carc. (day)	AT Ncarc. (day)	INH Carc. CDI	INH Ncarc. CDI	CSF (Kg-d/ mg)	RfD (mg/ Kg-d)	INH ICR	INH HI
Vinyl Chloride	1.70E+12	1.00E-03	392	120	0.5	24	70	25550	183	3.86E-07	5.41E-05	0.3		1.16E-07	0.00E+00

INHALATION TOTAL ==> 1.16E-07 | 0.00E+00

CONSTITUENTS	IRsoil (mg/d)	EF (d/yr)	ED (yr)	BW (Kg)	AT Carc. (day)	AT Ncarc. (day)	CF (10^-9 Kg/ug)	ING Carc. CDI	ING Ncarc. CDI	CSF (Kg-d/ mg)	RfD (mg/ Kg-d)	ING ICR	ING HI
Vinyl Chloride	100	120	0.5	70	25550	183	1.00E-09	6.31E-10	8.83E-08	1.9		1.20E-09	0.00E+00

INGESTION TOTAL == 1.20E-09 | 0.00E+00

TOTAL == 1.17E-07 | 0.00E+00

TABLE 19
SUMMARY OF NON-CARCINOGENIC HUMAN HEALTH RISKS
INCIDENTAL INGESTION OF AND DERMAL CONTACT WITH SURFACE WATER
BASED ON RESULTS OF MAXIMUM SAMPLE LOCATION (ST-2)
ADOLESCENT RESIDENTIAL EXPOSURE

CDI ing = [(CW)(IRgw)(CF)(EF)(ED)]/[(BW)(AT)]

WHERE:
CW = THE CHEMICAL CONCENTRATION (mg/L)
SA = THE SKIN SURFACE AREA AVAILABLE FOR CONTACT (cm^2)
PC = THE DERMAL PERMEABILITY CONSTANT (cm/hour)
CF = VOLUMETRIC CONVERSION FACTOR FOR WATER (L/1000 cm^3)
EF = THE EXPOSURE FREQUENCY (events/year)
ED = THE EXPOSURE DURATION (years)
ET = THE EXPOSURE TIME (hours/event or day)
BW = THE AVERAGE RECEPTOR BODY WEIGHT (Kg)
AT = THE AVERAGING TIME (ED (yrs) x 365d/yr)
CR = THE CONTACT RATE (L/hour)

ICR = SUM(CDII * CSFI) (ingestion or dermal)

HAZARD INDEX = SUM(CDII / RfDI) (ingestion or dermal)

TOTAL ICR = ICR ing + ICR dermal

TOTAL HI = HI ing + HI dermal

CDIi = CHRONIC DAILY INTAKE (per constituent)
ing = VIA INGESTION EXPOSURE
dermal = VIA DERMAL EXPOSURE
HI = HAZARD INDEX (non-carcinogenic risks)
ICR = INCREMENTAL CANCER RISK (carcinogenic risks)
CSFi = CANCER SLOPE FACTOR (per constituent)
RfDi = REFERENCE DOSE (per constituent)

CONSTITUENTS	CW * (mg/L)	EPA WEIGHT OF EVIDENCE
cis-1,2-Dichloroethen	0.017	D

* - The CW values for the surface water exposure is the maximum detected result obtained from the first sampling event at station ST-2.

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TABLE 19
SUMMARY OF NON-CARCINOGENIC HUMAN HEALTH RISKS
INCIDENTAL INGESTION OF AND DERMAL CONTACT WITH SURFACE WATER
BASED ON RESULTS OF MAXIMUM SAMPLE LOCATION (ST-2)
ADOLESCENT RESIDENTIAL EXPOSURE

CONSTITUENTS	CR (L/hour)	EF (e/yr)	ED (yr)	BW (Kg)	AT Carc. (day)	AT carc. (day)	ET (hrs/e)		ING Carc. CDI	ING Ncarc. CDI	CSF (Kg-d/ mg)	RfD (mg/ Kg-d)	ING ICR	ING HI	% carc. Risk
cis-1,2-Dichloroethene	0.05	25	6	55.9	25550	2190	2		1.79E-07	2.08E-06		1E-02	0.00E+00	2.08E-04	100.0
												INGESTION TOTAL =	0.00E+00	2.08E-04	100

CONSTITUENTS	PC (cm/hr)	CF (L/1000cc	SA (cm^2)	EF (d/yr)	ED (yrs)	ET (hr/d)	BW (Kg)	AT Carc. (day)	AT Ncarc (day)	DERMAL Carc. CDI	DERMAL Ncarc. CDI	CSF (Kg-d/mg	RfD (mg/Kg-d	DERMAL ICR	DERMAL HI	Perce Ncarc. Risk
cis-1,2-Dichloroethene	8.4E-04	1.00E-03	15800	25	6	2	55.9	25550	2190	4.74E-08	5.53E-07		1E-02	0.00E+00	5.53E-05	100.0
												DERMAL TOTAL ==>		0.00E+00	5.53E-05	100

TOTAL ==> 0 | 2.64E-04

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TABLE 20

SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HUMAN HEALTH RISKS
INHALATION OF VOLATILES ENTRUDING TO RESIDENCES
FROM CONSTITUENTS DETECTED IN OFF-SITE GROUNDWATER
GENERAL MOTORS - ALLISON PLANT 10

Carcinogens
Intake(c) = (Cair * IRair * EF * ED) / (BW * ATc * 365 days/year)
Risk = Intake * CSFinh

Noncarcinogens
Intake(nc) = (Cair * IRair * EF * ED) / (BW * ATnc * 365 days/year)
Risk = Intake / RfDinh

Input Parameter		Units	Value
Intake(c)	daily intake (dose) of carcinogen	mg/kg/day	--
Intake(nc)	daily intake (dose) of noncarcinogen	mg/kg/day	--
IRair	inhalation rate	m^3/day	15
EF	exposure frequency	days/year	350
ED	exposure duration	years	30
BW	body weight	kg	70
ATc	averaging time (carcinogen)	years	70
ATnc	averaging time (noncarcinogen)	years	30
CSFinh	inhalation cancer slope factor	1/(mg/kg/day)	chemical specific
RfDinh	inhalation reference dose	mg/kg/day	chemical specific
HQ	hazard quotient	unitless	--
Risk	risk level	unitless	--

Chemical	Cair	RfDinh	CSFinh	Intake(nc)	HQ	Intake(c)	Risk
Trichloroethene	0.000631172	NA	0.006	1.30E-04	NA	0.0000555827	3.3E-07

Hazard Index 0.00E+00 **Risk Level** 3.3E-07

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TABLE 21
SUMMARY OF CARCINOGENIC AND NON-CARCINOGENIC HUMAN HEALTH RISKS FOR ALL EXPOSURE PATHWAYS AND RECEPTOR GROUPS ASSESSED
GENERAL MOTORS - ALLISON PLANT 10

		Ingestion Haz Index	Total Haz Index	Inhalation Canc Risk	Ingestion Canc Risk	Total Canc Risk
On-Site Worker	*Surface Soil*	0.00E+00	0.00E+00	3.62E-06	3.00E-08	3.65E-06
	Subsurface Soil	0.00E+00	0.00E+00	2.90E-07	4.79E-09	2.95E-07
On-Site Construction Worker	*Surface or Subsurface Soil*	0.00E+00	0.00E+00	1.16E-07	1.20E-09	1.17E-07
Adult Resident	*Groundwater-to-Indoor Air*	--	N/A	3.30E-07	N/A	3.30E-07

		Ingestion Haz Index	Dermal Haz Index	Total Haz Index
Adolescent Resident (12-18)	*Surface Water*	2.08E-04	5.53E-05	2.64E-04

FLUOR DANIEL GTI

SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
INDIANAPOLIS WEST, INDIANA (1980)

SCALE 1:24,000

0 1/2 1 MILE

0 2,000 4,000

SCALE FEET

N

FLUOR DANIEL GTI 6330 E. 75TH ST., STE 176 INDIANAPOLIS, IN 46250 (317) 595-6400	DESIGNED: KG DETAILED: KG CHECKED:	**SITE LOCATION MAP** CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10 LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
		DRAWING DATE: 6/1/95 FIGURE: 1

Former Allison Pl 10

III B1b

Tab ____

Groundwater VOC Analytical Results (ug/L)

Former Allison Plant #10

700 Olin Avenue

Indianapolis, IN

Sample No.	Date Sampled	Lab Sample No.	Acetone	1,1-Dichloroethane	1,1-Dichloroethylene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloro-ethene	Vinyl chloride	All Other VOCs
MW-10-1	11/23/99	253788	<50	<5.0	<5.0	180	8.3	1,000	<5.0	ND
MW-154	11/23/99	253789	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-147	11/23/99	253790	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-132	11/23/99	253791	<50	<5.0	<5.0	990	18	270	580	ND
MW-148	11/23/99	253792	<50	11	5.2	1,200	24	310	200	ND
MW-155	11/23/99	253793	<50	<5.0	<5.0	200	<5.0	<5.0	260	ND
MW-158	11/23/99	253794	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-302	11/23/99	253795	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-153	11/23/99	253796	<50	<5.0	<5.0	950	19	330	67	ND
MW-202	11/23/99	253797	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-133	11/23/99	253798	<50	<5.0	<5.0	130	<5.0	57	7	ND
MW-145	11/23/99	253799	<50	<5.0	<5.0	770	14	<5.0	28	ND
MW-146	11/23/99	253800	<50	<5.0	<5.0	<5.0	<5.0	69	<5.0	ND
MW-152	11/23/99	253801	<50	<5.0	<5.0	<5.0	<5.0	110	<5.0	ND
MW-135	11/23/99	253802	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-150	11/23/99	253803	<50	<5.0	<5.0	14	<5.0	130	<5.0	ND
MW-200	11/23/99	253804	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
OB-1	11/23/99	253805	<50	<5.0	<5.0	270	8.9	870	<5.0	ND
OB-2	11/23/99	253806	<50	<5.0	<5.0	100	<5.0	800	<5.0	ND
MW-156	11/23/99	253807	<50	<5.0	<5.0	<5.0	<5.0	48	<5.0	ND
MW-301	11/23/99	253808	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-151	11/23/99	253809	<50	<5.0	<5.0	35	5.2	<5.0	<5.0	ND
MW-201	11/23/99	253810	97	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
TRIP	11/23/99	253811	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND
MW-10-1D	11/23/99	253812	<50	<5.0	<5.0	190	9.2	1,100	<5.0	ND
MW-145D	11/23/99	253813	<50	<5.0	<5.0	850	13	<5.0	31	ND
MW-200D	11/23/99	253814	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ND

Tab ___

Groundwater VOC Analytical Results (ug/L)
Former Allison Plant #10
700 Olin Avenue
Indianapolis, IN

Sample No.	Date Sampled	Lab Sample No.	Acetone	1,1-Dichloroethane	1,1-Dichloroethylene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Trichloro-ethene	Vinyl chloride	All Other VOCs
Tier II Residential Cleanup Goals - Groundwater [1]			3,040	640	7	70	120[2]	5	2	NA
Tier II Non-Residential Cleanup Goals - Groundwater [1]			10,220	10,220	7	1022	120[2]	260	10	NA

VOCs = Volatile Organic Compounds

Samples analyzed using EPA SW-846 Method 8260

ug/L = micorgrams per liter

NA = Not Applicable

[1] Indiana Department of Environmental Management Voluntary Remediation Program Resource Guide, Appendix F Tier II Cleanup Goals-Human Health Evaluation by Office of Environmental Response, July 1996

[2] Source: Region 3 Risk-Based Concentration Table - October 1998 Update

TestAmerica
INCORPORATED

ANALYTICAL AND QUALITY CONTROL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Enclosed is the Analytical and Quality Control reports for the following samples submitted to the TestAmerica, Inc. Indianapolis division.
Project Description: 2829/GENUINE PARTS

Sample Number	Sample Description	Date Taken	Date Received
253788	MW-10-1	11/23/1999	11/24/1999
253789	MW-154	11/23/1999	11/24/1999
253790	MW-147	11/23/1999	11/24/1999
253791	MW-132	11/23/1999	11/24/1999
253792	MW-148	11/23/1999	11/24/1999
253793	MW-155	11/23/1999	11/24/1999
253794	MW-158	11/23/1999	11/24/1999
253795	MW-302	11/23/1999	11/24/1999
253796	MW-153	11/23/1999	11/24/1999
253797	MW-202	11/23/1999	11/24/1999
253798	MW-133	11/23/1999	11/24/1999
253799	MW-145	11/23/1999	11/24/1999
253800	MW-146	11/23/1999	11/24/1999
253801	MW-152	11/23/1999	11/24/1999
253802	MW-135	11/23/1999	11/24/1999
253803	MW-150	11/23/1999	11/24/1999
253804	MW-200	11/23/1999	11/24/1999
253805	OB-1	11/23/1999	11/24/1999
253806	OB-2	11/23/1999	11/24/1999
253807	MW-156	11/23/1999	11/24/1999

The Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica, Inc. certifies that the analytical results contained herein apply only to the specific samples analyzed.

Reproduction of this analytical report is permitted only in its entirety.

Project Representative

6964 HILLSDALE CT. / INDIANAPOLIS, IN 46250 / 317-842-4261 / FAX: 317-842-4286

TestAmerica
INCORPORATED

ANALYTICAL AND QUALITY CONTROL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Enclosed is the Analytical and Quality Control reports for the following samples submitted to the TestAmerica, Inc. Indianapolis division.
Project Description: 2829/GENUINE PARTS

Sample Number	Sample Description	Date Taken	Date Received
253808	MW-301	11/23/1999	11/24/1999
253809	MW-151	11/23/1999	11/24/1999
253810	MW-201	11/23/1999	11/24/1999
253811	TRIP BLANK	11/23/1999	11/24/1999
253812	MW-10-1D	11/23/1999	11/24/1999
253813	MW-145D	11/23/1999	11/24/1999
253814	MW-200D	11/23/1999	11/24/1999

The Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TestAmerica, Inc. certifies that the analytical results contained herein apply only to the specific samples analyzed.

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Project Representative

6964 HILLSDALE CT. / INDIANAPOLIS, IN 46250 / 317-842-4261 / FAX: 317-842-4286

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253788	SAMPLE DESCRIPTION MW-10-1							DATE-TIME TAKEN 11/23/1999 12:15	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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SAMPLE NO. 253788 — SAMPLE DESCRIPTION MW-10-1 — DATE-TIME TAKEN 11/23/1999 12:15

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	180		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	8.3		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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SAMPLE NO. 253788 — SAMPLE DESCRIPTION MW-10-1 — DATE-TIME TAKEN 11/23/1999 12:15

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
n-Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	1,000	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	95		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	104.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253789	SAMPLE DESCRIPTION MW-154							DATE-TIME TAKEN 11/23/1999 09:45	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253789	SAMPLE DESCRIPTION MW-154							DATE-TIME TAKEN 11/23/1999 09:45	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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SAMPLE NO. 253789	SAMPLE DESCRIPTION MW-154							DATE-TIME TAKEN 11/23/1999 09:45	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
n-Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	93		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	105.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253790	SAMPLE DESCRIPTION MW-147							DATE-TIME TAKEN 11/23/1999 14:45	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253790	SAMPLE DESCRIPTION MW-147							DATE-TIME TAKEN 11/23/1999 14:45	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253790	SAMPLE DESCRIPTION MW-147							DATE-TIME TAKEN 11/23/1999 14:45	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	96		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	105.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	100.		%		12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253791	SAMPLE DESCRIPTION MW-132							DATE-TIME TAKEN 11/23/1999 09:55	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253791	SAMPLE DESCRIPTION MW-132							DATE-TIME TAKEN 11/23/1999 09:55	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	990	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	18.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253791	SAMPLE DESCRIPTION MW-132							DATE-TIME TAKEN 11/23/1999 09:55	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	270	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	580	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	96		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	108.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	101.		%		12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253792	SAMPLE DESCRIPTION MW-148							DATE-TIME TAKEN 11/23/1999 14:20	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253792	SAMPLE DESCRIPTION MW-148							DATE-TIME TAKEN 11/23/1999 14:20	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	11.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	5.2		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	1,200	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	24.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253792	SAMPLE DESCRIPTION MW-148							DATE-TIME TAKEN 11/23/1999 14:20	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	310	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	200		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	92		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	109.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	100		%		12/01/1999	jcb		2303	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253793	SAMPLE DESCRIPTION MW-155							DATE-TIME TAKEN 11/23/1999 14:50	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253793	SAMPLE DESCRIPTION MW-155							DATE-TIME TAKEN 11/23/1999 14:50	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	200	d1x5	ug/L	<25.	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253793	SAMPLE DESCRIPTION MW-155							DATE-TIME TAKEN 11/23/1999 14:50	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	260	d1x5	ug/L	<25.	12/03/1999	jcb		2306	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	94		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	109.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	97		%		12/01/1999	jcb		2303	SW 8260B

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Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253794	SAMPLE DESCRIPTION MW-158							DATE-TIME TAKEN 11/23/1999 15:15	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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330 North College Avenue
Indianapolis, IN 46202

12/08/1999

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253794	SAMPLE DESCRIPTION MW-158							DATE-TIME TAKEN 11/23/1999 15:15	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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330 North College Avenue
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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253794	SAMPLE DESCRIPTION MW-158							DATE-TIME TAKEN 11/23/1999 15:15	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
n-Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	96		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	106.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	102.		%		12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253795	SAMPLE DESCRIPTION MW-302							DATE-TIME TAKEN 11/23/1999 09:25	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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330 North College Avenue
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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253795	SAMPLE DESCRIPTION MW-302							DATE-TIME TAKEN 11/23/1999 09:25	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253795	SAMPLE DESCRIPTION MW-302							DATE-TIME TAKEN 11/23/1999 09:25	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	100		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	105.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	97		%		12/01/1999	jcb		2303	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253796	SAMPLE DESCRIPTION MW-153							DATE-TIME TAKEN 11/23/1999 08:35	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253796	SAMPLE DESCRIPTION MW-153							DATE-TIME TAKEN 11/23/1999 08:35	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	950	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	19.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253796	SAMPLE DESCRIPTION MW-153							DATE-TIME TAKEN 11/23/1999 08:35	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	330	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	67.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	93		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	108.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	100		%		12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253797	SAMPLE DESCRIPTION MW-202							DATE-TIME TAKEN 11/23/1999 09:05	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253797	SAMPLE DESCRIPTION MW-202							DATE-TIME TAKEN 11/23/1999 09:05	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253797	SAMPLE DESCRIPTION MW-202							DATE-TIME TAKEN 11/23/1999 09:05	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	96		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	103.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253798	SAMPLE DESCRIPTION MW-133							DATE-TIME TAKEN 11/23/1999 10:15	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253798	SAMPLE DESCRIPTION MW-133							DATE-TIME TAKEN 11/23/1999 10:15	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	130		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253798	SAMPLE DESCRIPTION MW-133							DATE-TIME TAKEN 11/23/1999 10:15	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Propylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tyrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	57.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	7.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	96		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	108.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	101.		%		12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
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Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253799	SAMPLE DESCRIPTION MW-145							DATE-TIME TAKEN 11/23/1999 13:00	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253799	SAMPLE DESCRIPTION MW-145							DATE-TIME TAKEN 11/23/1999 13:00	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	770	d1x10	ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	14.		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253799	SAMPLE DESCRIPTION MW-145							DATE-TIME TAKEN 11/23/1999 13:00	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	28.		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	96		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	106.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	101.		%		12/02/1999	jcb		2305	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253800	SAMPLE DESCRIPTION MW-146							DATE-TIME TAKEN 11/23/1999 12:40	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
Acrolein	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/01/1999	jcb		2303	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Chloroform	<20		ug/L	<20	12/01/1999	jcb		2303	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253800	SAMPLE DESCRIPTION MW-146							DATE-TIME TAKEN 11/23/1999 12:40	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/01/1999	jcb		2303	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253800	SAMPLE DESCRIPTION MW-146							DATE-TIME TAKEN 11/23/1999 12:40	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/01/1999	jcb		2303	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichloroethene	69.		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/01/1999	jcb		2303	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/01/1999	jcb		2303	SW 8260B
SURR: Toluene-d8	95		%		12/01/1999	jcb		2303	SW 8260B
SURR: Dibromofluoromethane	111.		%		12/01/1999	jcb		2303	SW 8260B
SURR: 4-Bromofluorobenzene	103.		%		12/01/1999	jcb		2303	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253801	SAMPLE DESCRIPTION MW-152							DATE-TIME TAKEN 11/23/1999 14:00	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253801	SAMPLE DESCRIPTION MW-152							DATE-TIME TAKEN 11/23/1999 14:00	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253801	SAMPLE DESCRIPTION MW-152							DATE-TIME TAKEN 11/23/1999 14:00	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	110		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	97		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	101.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253802	SAMPLE DESCRIPTION MW-135							DATE-TIME TAKEN 11/23/1999 10:25	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253802	SAMPLE DESCRIPTION MW-135							DATE-TIME TAKEN 11/23/1999 10:25	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253802	SAMPLE DESCRIPTION MW-135							DATE-TIME TAKEN 11/23/1999 10:25	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	96		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	104.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	100.		%		12/02/1999	jcb		2305	SW 8260B

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253803	SAMPLE DESCRIPTION MW-150							DATE-TIME TAKEN 11/23/1999 10:50	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253803	SAMPLE DESCRIPTION MW-150							DATE-TIME TAKEN 11/23/1999 10:50	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	14.		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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330 North College Avenue
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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253803	SAMPLE DESCRIPTION MW-150							DATE-TIME TAKEN 11/23/1999 10:50	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
n-Propylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	130		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	98		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	106.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	101.		%		12/02/1999	jcb		2305	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253804	SAMPLE DESCRIPTION MW-200							DATE-TIME TAKEN 11/23/1999 13:30	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253804	SAMPLE DESCRIPTION MW-200							DATE-TIME TAKEN 11/23/1999 13:30	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253804	SAMPLE DESCRIPTION MW-200							DATE-TIME TAKEN 11/23/1999 13:30	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	98		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	107.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	102.		%		12/02/1999	jcb		2305	SW 8260B

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330 North College Avenue
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12/08/1999

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253805	SAMPLE DESCRIPTION OB-1							DATE-TIME TAKEN 11/23/1999 12:10	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253805	SAMPLE DESCRIPTION OB-1							DATE-TIME TAKEN 11/23/1999 12:10	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	270	d1x10	ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	8.9		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253805	SAMPLE DESCRIPTION OB-1							DATE-TIME TAKEN 11/23/1999 12:10	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	870	d1x10	ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	101.		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	111.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	104.		%		12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253806	SAMPLE DESCRIPTION OB-2							DATE-TIME TAKEN 11/23/1999 12:20	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253806	SAMPLE DESCRIPTION OB-2							DATE-TIME TAKEN 11/23/1999 12:20	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	100		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253806	SAMPLE DESCRIPTION OB-2							DATE-TIME TAKEN 11/23/1999 12:20	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
n-Propylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	800	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	96		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	107.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	101.		%		12/02/1999	jcb		2305	SW 8260B

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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253807	SAMPLE DESCRIPTION MW-156							DATE-TIME TAKEN 11/23/1999 16:00	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/03/1999	jcb		2306	SW 8260B
Acrolein	<250		ug/L	<250	12/03/1999	jcb		2306	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/03/1999	jcb		2306	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Chloroform	<20		ug/L	<20	12/03/1999	jcb		2306	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253807	SAMPLE DESCRIPTION MW-156							DATE-TIME TAKEN 11/23/1999 16:00	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/03/1999	jcb		2306	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253807	SAMPLE DESCRIPTION MW-156							DATE-TIME TAKEN 11/23/1999 16:00	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Trichloroethene	48.		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
SURR: Toluene-d8	97		%		12/03/1999	jcb		2306	SW 8260B
SURR: Dibromofluoromethane	106.		%		12/03/1999	jcb		2306	SW 8260B
SURR: 4-Bromofluorobenzene	100.		%		12/03/1999	jcb		2306	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253808	SAMPLE DESCRIPTION MW-301							DATE-TIME TAKEN 11/23/1999 15:50	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2305	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2305	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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330 North College Avenue
Indianapolis, IN 46202

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Job Number: 99.06819

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253808	SAMPLE DESCRIPTION MW-301							DATE-TIME TAKEN 11/23/1999 15:50	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]chlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2305	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253808	SAMPLE DESCRIPTION MW-301							DATE-TIME TAKEN 11/23/1999 15:50	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2305	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]propylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2305	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/02/1999	jcb		2305	SW 8260B
SURR: Toluene-d8	99		%		12/02/1999	jcb		2305	SW 8260B
SURR: Dibromofluoromethane	110.		%		12/02/1999	jcb		2305	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/02/1999	jcb		2305	SW 8260B

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12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253809	SAMPLE DESCRIPTION MW-151							DATE-TIME TAKEN 11/23/1999 15:45	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Benzene	<5.0	q	ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorobenzene	<5.0	q	ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2307	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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12/08/1999

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253809	SAMPLE DESCRIPTION MW-151							DATE-TIME TAKEN 11/23/1999 15:45	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2307	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethene	<5.0	q	ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,2-Dichloroethene	35.		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,2-Dichloroethene	5.2		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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KERAMIDA ENVIRONMENTAL
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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253809	SAMPLE DESCRIPTION MW-151							DATE-TIME TAKEN 11/23/1999 15:45	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Toluene	<5.0	q	ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichloroethene	<5.0	q	ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0				2307	SW 8260B
SURR: Toluene-d8	92		%		12/02/1999	jcb		2307	SW 8260B
SURR: Dibromofluoromethane	114.		%		12/02/1999	jcb		2307	SW 8260B
SURR: 4-Bromofluorobenzene	100.		%		12/02/1999	jcb		2307	SW 8260B

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330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253810	SAMPLE DESCRIPTION MW-201							DATE-TIME TAKEN 11/23/1999 18:15	
VOLATILES-8260 (AQ)									
Acetone	97.		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
[illegible]plein	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
[illegible]rylonitrile	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2307	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253810	SAMPLE DESCRIPTION MW-201							DATE-TIME TAKEN 11/23/1999 18:15	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2307	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253810	SAMPLE DESCRIPTION MW-201							DATE-TIME TAKEN 11/23/1999 18:15	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0				2307	SW 8260B
SURR: Toluene-d8	92		%		12/02/1999	jcb		2307	SW 8260B
SURR: Dibromofluoromethane	105.		%		12/02/1999	jcb		2307	SW 8260B
SURR: 4-Bromofluorobenzene	97		%		12/02/1999	jcb		2307	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253811	SAMPLE DESCRIPTION TRIP BLANK						DATE-TIME TAKEN 11/23/1999		
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/03/1999	jcb		2306	SW 8260B
[illegible]plein	<250		ug/L	<250	12/03/1999	jcb		2306	SW 8260B
[illegible]rylonitrile	<250		ug/L	<250	12/03/1999	jcb		2306	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Chloroform	<20		ug/L	<20	12/03/1999	jcb		2306	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253811	SAMPLE DESCRIPTION TRIP BLANK							DATE-TIME TAKEN 11/23/1999	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/03/1999	jcb		2306	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253811	SAMPLE DESCRIPTION TRIP BLANK							DATE-TIME TAKEN 11/23/1999	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/03/1999	jcb		2306	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Styrene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/03/1999	jcb		2306	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0	12/03/1999	jcb		2306	SW 8260B
SURR: Toluene-d8	97		%		12/03/1999	jcb		2306	SW 8260B
SURR: Dibromofluoromethane	106.		%		12/03/1999	jcb		2306	SW 8260B
SURR: 4-Bromofluorobenzene	99		%		12/03/1999	jcb		2306	SW 8260B

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330 North College Avenue
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Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253812	SAMPLE DESCRIPTION MW-10-1D							DATE-TIME TAKEN 11/23/1999 12:15	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2307	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253812	SAMPLE DESCRIPTION MW-10-1D							DATE-TIME TAKEN 11/23/1999 12:15	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2307	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,2-Dichloroethene	190		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,2-Dichloroethene	9.2		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253812	SAMPLE DESCRIPTION MW-10-1D							DATE-TIME TAKEN 11/23/1999 12:15	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]tyrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichloroethene	1,100	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0				2307	SW 8260B
SURR: Toluene-d8	95		%		12/02/1999	jcb		2307	SW 8260B
SURR: Dibromofluoromethane	117.		%		12/02/1999	jcb		2307	SW 8260B
SURR: 4-Bromofluorobenzene	98		%		12/02/1999	jcb		2307	SW 8260B

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Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253813	SAMPLE DESCRIPTION MW-145D							DATE-TIME TAKEN 11/23/1999 13:00	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2307	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253813	SAMPLE DESCRIPTION MW-145D							DATE-TIME TAKEN 11/23/1999 13:00	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2307	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,2-Dichloroethene	850	d1x20	ug/L	<100	12/03/1999	jcb		2306	SW 8260B
trans-1,2-Dichloroethene	13.		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253813	SAMPLE DESCRIPTION MW-145D							DATE-TIME TAKEN 11/23/1999 13:00	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]ropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Vinyl chloride	31.		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0				2307	SW 8260B
SURR: Toluene-d8	96		%		12/02/1999	jcb		2307	SW 8260B
SURR: Dibromofluoromethane	111.		%		12/02/1999	jcb		2307	SW 8260B
SURR: 4-Bromofluorobenzene	100		%		12/02/1999	jcb		2307	SW 8260B

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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253814	SAMPLE DESCRIPTION MW-200D							DATE-TIME TAKEN 11/23/1999 13:30	
VOLATILES-8260 (AQ)									
Acetone	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
Acrolein	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Acrylonitrile	<250		ug/L	<250	12/02/1999	jcb		2307	SW 8260B
Benzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromochloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromodichloromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromoform	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Bromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
n-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
sec-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
tert-Butylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon disulfide	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Carbon tetrachloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chlorodibromomethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Chloroethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Chloroform	<20		ug/L	<20	12/02/1999	jcb		2307	SW 8260B
Chloromethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
4-Chlorotoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2-Chloroethyl vinyl ether	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromo-3-chloropropane	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
1,2-Dibromoethane(EDB)	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dibromomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

TestAmerica
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ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253814	SAMPLE DESCRIPTION MW-200D							DATE-TIME TAKEN 11/23/1999 13:30	
1,2-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,4-Dichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Dichlorodifluoromethane	<10		ug/L	<10	12/02/1999	jcb		2307	SW 8260B
trans-1,4-Dichloro-2-butene	<50		ug/L	<50	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,2-Dichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
2,2-Dichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
cis-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
trans-1,3-Dichloropropene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Ethyl methacrylate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
2-Hexanone	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Hexachlorobutadiene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Iodomethane	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Isopropylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
p-Isopropyltoluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Methylene chloride	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Methyl-ethyl-ketone (MEK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Methyl-tert-butyl ether (MTBE)	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B

TestAmerica
INCORPORATED

ANALYTICAL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Client Project ID: 2829/GENUINE PARTS

Analyte	Result	Flag	Units	Reporting Limit	Date Analyzed	Analyst Initials	Prep Batch No.	Run Batch No.	Method Reference
SAMPLE NO. 253814	SAMPLE DESCRIPTION MW-200D							DATE-TIME TAKEN 11/23/1999 13:30	
4-Methyl-2-pentanone (MIBK)	<50.		ug/L	<50.	12/02/1999	jcb		2307	SW 8260B
Naphthalene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]propylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
[illegible]yrene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2,2-Tetrachloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Tetrachloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Toluene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trichlorobenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,1-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,1,2-Trichloroethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichloroethene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Trichlorofluoromethane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,3-Trichloropropane	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,2,4-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
1,3,5-Trimethylbenzene	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Vinyl acetate	<10.		ug/L	<10.	12/02/1999	jcb		2307	SW 8260B
Vinyl chloride	<5.0		ug/L	<5.0	12/02/1999	jcb		2307	SW 8260B
Xylenes, (Total)	<5.0		ug/L	<5.0				2307	SW 8260B
SURR: Toluene-d8	93		%		12/02/1999	jcb		2307	SW 8260B
SURR: Dibromofluoromethane	108.		%		12/02/1999	jcb		2307	SW 8260B
SURR: 4-Bromofluorobenzene	100		%		12/02/1999	jcb		2307	SW 8260B

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Page 84 of 110

The following samples were submitted to TestAmerica, Inc. Indianapolis Division for analysis:

Project Description: 2829/GENUINE PARTS

Sample Number	Sample Description	Date Taken	Date Received
253788	MW-10-1	11/23/1999	11/24/1999
253789	MW-154	11/23/1999	11/24/1999
253790	MW-147	11/23/1999	11/24/1999
253791	MW-132	11/23/1999	11/24/1999
253792	MW-148	11/23/1999	11/24/1999
253793	MW-155	11/23/1999	11/24/1999
253794	MW-158	11/23/1999	11/24/1999
253795	MW-302	11/23/1999	11/24/1999
253796	MW-153	11/23/1999	11/24/1999
253797	MW-202	11/23/1999	11/24/1999
253798	MW-133	11/23/1999	11/24/1999
253799	MW-145	11/23/1999	11/24/1999
253800	MW-146	11/23/1999	11/24/1999
253801	MW-152	11/23/1999	11/24/1999
253802	MW-135	11/23/1999	11/24/1999
253803	MW-150	11/23/1999	11/24/1999
253804	MW-200	11/23/1999	11/24/1999
253805	OB-1	11/23/1999	11/24/1999

Approved by:

6964 HILLSDALE CT. / INDIANAPOLIS, IN 46250 / 317-842-4261 / FAX: 317-842-4286

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Page 85 of 110

The following samples were submitted to TestAmerica, Inc. Indianapolis Division for analysis:

Project Description: 2829/GENUINE PARTS

Sample Number	Sample Description	Date Taken	Date Received
253806	OB-2	11/23/1999	11/24/1999
253807	MW-156	11/23/1999	11/24/1999
253808	MW-301	11/23/1999	11/24/1999
253809	MW-151	11/23/1999	11/24/1999
253810	MW-201	11/23/1999	11/24/1999
253811	TRIP BLANK	11/23/1999	11/24/1999
253812	MW-10-1D	11/23/1999	11/24/1999
253813	MW-145D	11/23/1999	11/24/1999
253814	MW-200D	11/23/1999	11/24/1999

Approved by:

6964 HILLSDALE CT. / INDIANAPOLIS, IN 46250 / 317-842-4261 / FAX: 317-842-4286

TestAmerica
INCORPORATED

QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
VOLATILES-8260 (AQ)							
Bromoform		2303	50.0	56.7	113		12/01/1999
Chlorobenzene		2303	50.0	49.7	99		12/01/1999
Chloroform		2303	50.0	59.4	119		12/01/1999
Chloromethane		2303	50.0	48.4	97		12/01/1999
1,1-Dichloroethane		2303	50.0	54.7	109		12/01/1999
1,1-Dichloroethene		2303	50.0	54.4	109		12/01/1999
1,2-Dichloropropane		2303	50.0	53.0	106		12/01/1999
Ethylbenzene		2303	50.0	47.9	96		12/01/1999
1,1,2,2-Tetrachloroethane		2303	50.0	49.7	99		12/01/1999
Toluene		2303	50.0	52.9	106		12/01/1999
Vinyl chloride		2303	50.0	55.4	111		12/01/1999

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QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Mr. Frank West
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330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
VOLATILES-8260 (AQ)							
Bromoform		2305	50.0	50.0	100		12/02/1999
Chlorobenzene		2305	50.0	46.5	93		12/02/1999
Chloroform		2305	50.0	52.8	106		12/02/1999
Chloromethane		2305	50.0	35.7	71		12/02/1999
1,1-Dichloroethane		2305	50.0	48.5	97		12/02/1999
1,1-Dichloroethene		2305	50.0	48.9	98		12/02/1999
1,2-Dichloropropane		2305	50.0	48.8	98		12/02/1999
Ethylbenzene		2305	50.0	45.7	91		12/02/1999
1,1,2,2-Tetrachloroethane		2305	50.0	44.0	88		12/02/1999
Toluene		2305	50.0	51.2	102		12/02/1999
Vinyl chloride		2305	50.0	52.7	105		12/02/1999

TestAmerica
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QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Mr. Frank West
KERAMIDA ENVIRONMENTAL
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12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
VOLATILES-8260 (AQ)							
Bromoform		2306	50.0	54.9	110		12/03/1999
Chlorobenzene		2306	50.0	47.6	95		12/03/1999
Chloroform		2306	50.0	55.0	110		12/03/1999
Chloromethane		2306	50.0	39.2	78		12/03/1999
1,1-Dichloroethane		2306	50.0	48.7	97		12/03/1999
1,1-Dichloroethene		2306	50.0	49.8	100		12/03/1999
1,2-Dichloropropane		2306	50.0	49.3	99		12/03/1999
Ethylbenzene		2306	50.0	46.3	93		12/03/1999
1,1,2,2-Tetrachloroethane		2306	50.0	40.9	82		12/03/1999
Toluene		2306	50.0	49.2	98		12/03/1999
Vinyl chloride		2306	50.0	51.9	104		12/03/1999

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QUALITY CONTROL REPORT
CONTINUING CALIBRATION VERIFICATION

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	CCV True Value	CCV Conc Found	CCV % Rec	Flag	Date Analyzed
VOLATILES-8260 (AQ)							
Bromoform		2307	50.0	56.9	114		12/02/1999
Chlorobenzene		2307	50.0	50.1	100		12/02/1999
Chloroform		2307	50.0	56.9	114		12/02/1999
Chloromethane		2307	50.0	41.3	83		12/02/1999
1,1-Dichloroethane		2307	50.0	51.4	103		12/02/1999
1,1-Dichloroethene		2307	50.0	52.4	105		12/02/1999
1,2-Dichloropropane		2307	50.0	53.7	107		12/02/1999
Ethylbenzene		2307	50.0	47.9	96		12/02/1999
1,1,2,2-Tetrachloroethane		2307	50.0	52.7	105		12/02/1999
Toluene		2307	50.0	55.0	110		12/02/1999
Vinyl chloride		2307	50.0	53.7	107		12/02/1999

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QUALITY CONTROL REPORT
BLANKS

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
VOLATILES-8260 (AQ)							
Acetone		2303	<50		ug/L	<50	12/01/1999
Acrolein		2303	<250		ug/L	<250	12/01/1999
Acrylonitrile		2303	<250		ug/L	<250	12/01/1999
Benzene		2303	<5.0		ug/L	<5.0	12/01/1999
Bromobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Bromochloromethane		2303	<5.0		ug/L	<5.0	12/01/1999
Bromodichloromethane		2303	<5.0		ug/L	<5.0	12/01/1999
Bromoform		2303	<5.0		ug/L	<5.0	12/01/1999
Bromomethane		2303	<10.		ug/L	<10.	12/01/1999
n-Butylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
sec-Butylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
tert-Butylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Carbon disulfide		2303	<5.0		ug/L	<5.0	12/01/1999
Carbon tetrachloride		2303	<5.0		ug/L	<5.0	12/01/1999
Chlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Chlorodibromomethane		2303	<5.0		ug/L	<5.0	12/01/1999
Chloroethane		2303	<10.		ug/L	<10.	12/01/1999
Chloroform		2303	<20		ug/L	<20	12/01/1999
Chloromethane		2303	<10.		ug/L	<10.	12/01/1999
2-Chlorotoluene		2303	<5.0		ug/L	<5.0	12/01/1999
4-Chlorotoluene		2303	<5.0		ug/L	<5.0	12/01/1999
2-Chloroethyl vinyl ether		2303	<50.		ug/L	<50.	12/01/1999
1,2-Dibromo-3-chloropropane		2303	<50.		ug/L	<50.	12/01/1999
1,2-Dibromoethane(EDB)		2303	<5.0		ug/L	<5.0	12/01/1999
Dibromomethane		2303	<10.		ug/L	<10.	12/01/1999
1,2-Dichlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
1,3-Dichlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
1,4-Dichlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Dichlorodifluoromethane		2303	<10		ug/L	<10	12/01/1999
trans-1,4-Dichloro-2-butene		2303	<50		ug/L	<50	12/01/1999
1,1-Dichloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
1,2-Dichloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
1,1-Dichloroethene		2303	<5.0		ug/L	<5.0	12/01/1999

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
cis-1,2-Dichloroethene		2303	<5.0		ug/L	<5.0	12/01/1999
trans-1,2-Dichloroethene		2303	<5.0		ug/L	<5.0	12/01/1999
1,2-Dichloropropane		2303	<5.0		ug/L	<5.0	12/01/1999
1,3-Dichloropropane		2303	<5.0		ug/L	<5.0	12/01/1999
2,2-Dichloropropane		2303	<5.0		ug/L	<5.0	12/01/1999
1,1-Dichloropropene		2303	<5.0		ug/L	<5.0	12/01/1999
cis-1,3-Dichloropropene		2303	<5.0		ug/L	<5.0	12/01/1999
trans-1,3-Dichloropropene		2303	<5.0		ug/L	<5.0	12/01/1999
Ethylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Ethyl methacrylate		2303	<10.		ug/L	<10.	12/01/1999
2-Hexanone		2303	<50.		ug/L	<50.	12/01/1999
Hexachlorobutadiene		2303	<5.0		ug/L	<5.0	12/01/1999
Iodomethane		2303	<10.		ug/L	<10.	12/01/1999
Isopropylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
p-Isopropyltoluene		2303	<5.0		ug/L	<5.0	12/01/1999
Methylene chloride		2303	<10.		ug/L	<10.	12/01/1999
Methyl-ethyl-ketone (MEK)		2303	<50.		ug/L	<50.	12/01/1999
Methyl-tert-butyl ether (MTBE)		2303	<10.		ug/L	<10.	12/01/1999
4-Methyl-2-pentanone (MIBK)		2303	<50.		ug/L	<50.	12/01/1999
Naphthalene		2303	<5.0		ug/L	<5.0	12/01/1999
n-Propylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Styrene		2303	<5.0		ug/L	<5.0	12/01/1999
1,1,1,2-Tetrachloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
1,1,2,2-Tetrachloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
Tetrachloroethene		2303	<5.0		ug/L	<5.0	12/01/1999
Toluene		2303	<5.0		ug/L	<5.0	12/01/1999
1,2,3-Trichlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
1,2,4-Trichlorobenzene		2303	<5.0		ug/L	<5.0	12/01/1999
1,1,1-Trichloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
1,1,2-Trichloroethane		2303	<5.0		ug/L	<5.0	12/01/1999
Trichloroethene		2303	<5.0		ug/L	<5.0	12/01/1999
Trichlorofluoromethane		2303	<5.0		ug/L	<5.0	12/01/1999
1,2,3-Trichloropropane		2303	<5.0		ug/L	<5.0	12/01/1999
1,2,4-Trimethylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
1,3,5-Trimethylbenzene		2303	<5.0		ug/L	<5.0	12/01/1999
Vinyl acetate		2303	<10.		ug/L	<10.	12/01/1999
Vinyl chloride		2303	<5.0		ug/L	<5.0	12/01/1999
Xylenes, (Total)		2303	<5.0		ug/L	<5.0	12/01/1999
SURR: Toluene-d8		2303	95		%		12/01/1999
SURR: Dibromofluoromethane		2303	104.		%		12/01/1999
SURR: 4-Bromofluorobenzene		2303	101.		%		12/01/1999

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330 North College Avenue
Indianapolis, IN 46202

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Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
VOLATILES-8260 (AQ)							
Acetone		2305	<50		ug/L	<50	12/02/1999
Acrolein		2305	<250		ug/L	<250	12/02/1999
Acrylonitrile		2305	<250		ug/L	<250	12/02/1999
Benzene		2305	<5.0		ug/L	<5.0	12/02/1999
Bromobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Bromochloromethane		2305	<5.0		ug/L	<5.0	12/02/1999
Bromodichloromethane		2305	<5.0		ug/L	<5.0	12/02/1999
Bromoform		2305	<5.0		ug/L	<5.0	12/02/1999
Bromomethane		2305	<10.		ug/L	<10.	12/02/1999
n-Butylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
sec-Butylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
tert-Butylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Carbon disulfide		2305	<5.0		ug/L	<5.0	12/02/1999
Carbon tetrachloride		2305	<5.0		ug/L	<5.0	12/02/1999
Chlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Chlorodibromomethane		2305	<5.0		ug/L	<5.0	12/02/1999
Chloroethane		2305	<10.		ug/L	<10.	12/02/1999
Chloroform		2305	<20		ug/L	<20	12/02/1999
Chloromethane		2305	<10.		ug/L	<10.	12/02/1999
2-Chlorotoluene		2305	<5.0		ug/L	<5.0	12/02/1999
4-Chlorotoluene		2305	<5.0		ug/L	<5.0	12/02/1999
2-Chloroethyl vinyl ether		2305	<50.		ug/L	<50.	12/02/1999
1,2-Dibromo-3-chloropropane		2305	<50.		ug/L	<50.	12/02/1999
1,2-Dibromoethane(EDB)		2305	<5.0		ug/L	<5.0	12/02/1999
Dibromomethane		2305	<10.		ug/L	<10.	12/02/1999
1,2-Dichlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
1,3-Dichlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
1,4-Dichlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Dichlorodifluoromethane		2305	<10		ug/L	<10	12/02/1999
trans-1,4-Dichloro-2-butene		2305	<50		ug/L	<50	12/02/1999
1,1-Dichloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
1,2-Dichloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
1,1-Dichloroethene		2305	<5.0		ug/L	<5.0	12/02/1999

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
cis-1,2-Dichloroethene		2305	<5.0		ug/L	<5.0	12/02/1999
trans-1,2-Dichloroethene		2305	<5.0		ug/L	<5.0	12/02/1999
1,2-Dichloropropane		2305	<5.0		ug/L	<5.0	12/02/1999
1,3-Dichloropropane		2305	<5.0		ug/L	<5.0	12/02/1999
2,2-Dichloropropane		2305	<5.0		ug/L	<5.0	12/02/1999
1,1-Dichloropropene		2305	<5.0		ug/L	<5.0	12/02/1999
cis-1,3-Dichloropropene		2305	<5.0		ug/L	<5.0	12/02/1999
trans-1,3-Dichloropropene		2305	<5.0		ug/L	<5.0	12/02/1999
Ethylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Ethyl methacrylate		2305	<10.		ug/L	<10.	12/02/1999
2-Hexanone		2305	<50.		ug/L	<50.	12/02/1999
Hexachlorobutadiene		2305	<5.0		ug/L	<5.0	12/02/1999
Iodomethane		2305	<10.		ug/L	<10.	12/02/1999
Isopropylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
p-Isopropyltoluene		2305	<5.0		ug/L	<5.0	12/02/1999
Methylene chloride		2305	<10.		ug/L	<10.	12/02/1999
Methyl-ethyl-ketone (MEK)		2305	<50.		ug/L	<50.	12/02/1999
Methyl-tert-butyl ether (MTBE)		2305	<10.		ug/L	<10.	12/02/1999
4-Methyl-2-pentanone (MIBK)		2305	<50.		ug/L	<50.	12/02/1999
Naphthalene		2305	<5.0		ug/L	<5.0	12/02/1999
n-Propylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Styrene		2305	<5.0		ug/L	<5.0	12/02/1999
1,1,1,2-Tetrachloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
1,1,2,2-Tetrachloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
Tetrachloroethene		2305	<5.0		ug/L	<5.0	12/02/1999
Toluene		2305	<5.0		ug/L	<5.0	12/02/1999
1,2,3-Trichlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
1,2,4-Trichlorobenzene		2305	<5.0		ug/L	<5.0	12/02/1999
1,1,1-Trichloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
1,1,2-Trichloroethane		2305	<5.0		ug/L	<5.0	12/02/1999
Trichloroethene		2305	<5.0		ug/L	<5.0	12/02/1999
Trichlorofluoromethane		2305	<5.0		ug/L	<5.0	12/02/1999
1,2,3-Trichloropropane		2305	<5.0		ug/L	<5.0	12/02/1999
1,2,4-Trimethylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
1,3,5-Trimethylbenzene		2305	<5.0		ug/L	<5.0	12/02/1999
Vinyl acetate		2305	<10.		ug/L	<10.	12/02/1999
Vinyl chloride		2305	<5.0		ug/L	<5.0	12/02/1999
Xylenes, (Total)		2305	<5.0		ug/L	<5.0	12/02/1999
SURR: Toluene-d8		2305	97		%		12/02/1999
SURR: Dibromofluoromethane		2305	104.		%		12/02/1999
SURR: 4-Bromofluorobenzene		2305	99		%		12/02/1999

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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
VOLATILES-8260 (AQ)							
Acetone		2306	<50		ug/L	<50	12/03/1999
Acrolein		2306	<250		ug/L	<250	12/03/1999
Acrylonitrile		2306	<250		ug/L	<250	12/03/1999
Benzene		2306	<5.0		ug/L	<5.0	12/03/1999
Bromobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Bromochloromethane		2306	<5.0		ug/L	<5.0	12/03/1999
Bromodichloromethane		2306	<5.0		ug/L	<5.0	12/03/1999
Bromoform		2306	<5.0		ug/L	<5.0	12/03/1999
Bromomethane		2306	<10.		ug/L	<10.	12/03/1999
n-Butylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
sec-Butylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
tert-Butylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Carbon disulfide		2306	<5.0		ug/L	<5.0	12/03/1999
Carbon tetrachloride		2306	<5.0		ug/L	<5.0	12/03/1999
Chlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Chlorodibromomethane		2306	<5.0		ug/L	<5.0	12/03/1999
Chloroethane		2306	<10.		ug/L	<10.	12/03/1999
Chloroform		2306	<20		ug/L	<20	12/03/1999
Chloromethane		2306	<10.		ug/L	<10.	12/03/1999
2-Chlorotoluene		2306	<5.0		ug/L	<5.0	12/03/1999
4-Chlorotoluene		2306	<5.0		ug/L	<5.0	12/03/1999
2-Chloroethyl vinyl ether		2306	<50.		ug/L	<50.	12/03/1999
1,2-Dibromo-3-chloropropane		2306	<50.		ug/L	<50.	12/03/1999
1,2-Dibromoethane(EDB)		2306	<5.0		ug/L	<5.0	12/03/1999
Dibromomethane		2306	<10.		ug/L	<10.	12/03/1999
1,2-Dichlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
1,3-Dichlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
1,4-Dichlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Dichlorodifluoromethane		2306	<10		ug/L	<10	12/03/1999
trans-1,4-Dichloro-2-butene		2306	<50		ug/L	<50	12/03/1999
1,1-Dichloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
1,2-Dichloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
1,1-Dichloroethene		2306	<5.0		ug/L	<5.0	12/03/1999

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330 North College Avenue
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Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
cis-1,2-Dichloroethene		2306	<5.0		ug/L	<5.0	12/03/1999
trans-1,2-Dichloroethene		2306	<5.0		ug/L	<5.0	12/03/1999
1,2-Dichloropropane		2306	<5.0		ug/L	<5.0	12/03/1999
1,3-Dichloropropane		2306	<5.0		ug/L	<5.0	12/03/1999
2,2-Dichloropropane		2306	<5.0		ug/L	<5.0	12/03/1999
1,1-Dichloropropene		2306	<5.0		ug/L	<5.0	12/03/1999
cis-1,3-Dichloropropene		2306	<5.0		ug/L	<5.0	12/03/1999
trans-1,3-Dichloropropene		2306	<5.0		ug/L	<5.0	12/03/1999
Ethylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Ethyl methacrylate		2306	<10.		ug/L	<10.	12/03/1999
2-Hexanone		2306	<50.		ug/L	<50.	12/03/1999
Hexachlorobutadiene		2306	<5.0		ug/L	<5.0	12/03/1999
Iodomethane		2306	<10.		ug/L	<10.	12/03/1999
Isopropylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
p-Isopropyltoluene		2306	<5.0		ug/L	<5.0	12/03/1999
Methylene chloride		2306	<10.		ug/L	<10.	12/03/1999
Methyl-ethyl-ketone (MEK)		2306	<50.		ug/L	<50.	12/03/1999
Methyl-tert-butyl ether (MTBE)		2306	<10.		ug/L	<10.	12/03/1999
4-Methyl-2-pentanone (MIBK)		2306	<50.		ug/L	<50.	12/03/1999
Naphthalene		2306	<5.0		ug/L	<5.0	12/03/1999
n-Propylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Styrene		2306	<5.0		ug/L	<5.0	12/03/1999
1,1,1,2-Tetrachloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
1,1,2,2-Tetrachloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
Tetrachloroethene		2306	<5.0		ug/L	<5.0	12/03/1999
Toluene		2306	<5.0		ug/L	<5.0	12/03/1999
1,2,3-Trichlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
1,2,4-Trichlorobenzene		2306	<5.0		ug/L	<5.0	12/03/1999
1,1,1-Trichloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
1,1,2-Trichloroethane		2306	<5.0		ug/L	<5.0	12/03/1999
Trichloroethene		2306	<5.0		ug/L	<5.0	12/03/1999
Trichlorofluoromethane		2306	<5.0		ug/L	<5.0	12/03/1999
1,2,3-Trichloropropane		2306	<5.0		ug/L	<5.0	12/03/1999
1,2,4-Trimethylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999

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QUALITY CONTROL REPORT
BLANKS

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
1,3,5-Trimethylbenzene		2306	<5.0		ug/L	<5.0	12/03/1999
Vinyl acetate		2306	<10.		ug/L	<10.	12/03/1999
Vinyl chloride		2306	<5.0		ug/L	<5.0	12/03/1999
Xylenes, (Total)		2306	<5.0		ug/L	<5.0	12/03/1999
SURR: Toluene-d8		2306	97		%		12/03/1999
SURR: Dibromofluoromethane		2306	110.		%		12/03/1999
SURR: 4-Bromofluorobenzene		2306	99		%		12/03/1999

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Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
VOLATILES-8260 (AQ)							
Acetone		2307	<50		ug/L	<50	12/02/1999
Acrolein		2307	<250		ug/L	<250	12/02/1999
Acrylonitrile		2307	<250		ug/L	<250	12/02/1999
Benzene		2307	<5.0		ug/L	<5.0	12/02/1999
Bromobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Bromochloromethane		2307	<5.0		ug/L	<5.0	12/02/1999
Bromodichloromethane		2307	<5.0		ug/L	<5.0	12/02/1999
Bromoform		2307	<5.0		ug/L	<5.0	12/02/1999
Bromomethane		2307	<10.		ug/L	<10.	12/02/1999
n-Butylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
sec-Butylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
tert-Butylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Carbon disulfide		2307	<5.0		ug/L	<5.0	12/02/1999
Carbon tetrachloride		2307	<5.0		ug/L	<5.0	12/02/1999
Chlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Chlorodibromomethane		2307	<5.0		ug/L	<5.0	12/02/1999
Chloroethane		2307	<10.		ug/L	<10.	12/02/1999
Chloroform		2307	<20		ug/L	<20	12/02/1999
Chloromethane		2307	<10.		ug/L	<10.	12/02/1999
2-Chlorotoluene		2307	<5.0		ug/L	<5.0	12/02/1999
4-Chlorotoluene		2307	<5.0		ug/L	<5.0	12/02/1999
2-Chloroethyl vinyl ether		2307	<50.		ug/L	<50.	12/02/1999
1,2-Dibromo-3-chloropropane		2307	<50.		ug/L	<50.	12/02/1999
1,2-Dibromoethane(EDB)		2307	<5.0		ug/L	<5.0	12/02/1999
Dibromomethane		2307	<10.		ug/L	<10.	12/02/1999
1,2-Dichlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
1,3-Dichlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
1,4-Dichlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Dichlorodifluoromethane		2307	<10		ug/L	<10	12/02/1999
trans-1,4-Dichloro-2-butene		2307	<50		ug/L	<50	12/02/1999
1,1-Dichloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
1,2-Dichloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
1,1-Dichloroethene		2307	<5.0		ug/L	<5.0	12/02/1999

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QUALITY CONTROL REPORT
BLANKS

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
cis-1,2-Dichloroethene		2307	<5.0		ug/L	<5.0	12/02/1999
trans-1,2-Dichloroethene		2307	<5.0		ug/L	<5.0	12/02/1999
1,2-Dichloropropane		2307	<5.0		ug/L	<5.0	12/02/1999
1,3-Dichloropropane		2307	<5.0		ug/L	<5.0	12/02/1999
2,2-Dichloropropane		2307	<5.0		ug/L	<5.0	12/02/1999
1,1-Dichloropropene		2307	<5.0		ug/L	<5.0	12/02/1999
cis-1,3-Dichloropropene		2307	<5.0		ug/L	<5.0	12/02/1999
trans-1,3-Dichloropropene		2307	<5.0		ug/L	<5.0	12/02/1999
Ethylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Ethyl methacrylate		2307	<10.		ug/L	<10.	12/02/1999
2-Hexanone		2307	<50.		ug/L	<50.	12/02/1999
Hexachlorobutadiene		2307	<5.0		ug/L	<5.0	12/02/1999
Iodomethane		2307	<10.		ug/L	<10.	12/02/1999
Isopropylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
p-Isopropyltoluene		2307	<5.0		ug/L	<5.0	12/02/1999
Methylene chloride		2307	<10.		ug/L	<10.	12/02/1999
Methyl-ethyl-ketone (MEK)		2307	<50.		ug/L	<50.	12/02/1999
Methyl-tert-butyl ether (MTBE)		2307	<10.		ug/L	<10.	12/02/1999
4-Methyl-2-pentanone (MIBK)		2307	<50.		ug/L	<50.	12/02/1999
Naphthalene		2307	<5.0		ug/L	<5.0	12/02/1999
n-Propylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Styrene		2307	<5.0		ug/L	<5.0	12/02/1999
1,1,1,2-Tetrachloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
1,1,2,2-Tetrachloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
Tetrachloroethene		2307	<5.0		ug/L	<5.0	12/02/1999
Toluene		2307	<5.0		ug/L	<5.0	12/02/1999
1,2,3-Trichlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
1,2,4-Trichlorobenzene		2307	<5.0		ug/L	<5.0	12/02/1999
1,1,1-Trichloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
1,1,2-Trichloroethane		2307	<5.0		ug/L	<5.0	12/02/1999
Trichloroethene		2307	<5.0		ug/L	<5.0	12/02/1999
Trichlorofluoromethane		2307	<5.0		ug/L	<5.0	12/02/1999
1,2,3-Trichloropropane		2307	<5.0		ug/L	<5.0	12/02/1999
1,2,4-Trimethylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999

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QUALITY CONTROL REPORT
BLANKS

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Blank Value	Flag	Units	Reporting Limit	Date Analyzed
1,3,5-Trimethylbenzene		2307	<5.0		ug/L	<5.0	12/02/1999
Vinyl acetate		2307	<10.		ug/L	<10.	12/02/1999
Vinyl chloride		2307	<5.0		ug/L	<5.0	12/02/1999
Xylenes, (Total)		2307	<5.0		ug/L	<5.0	12/02/1999
SURR: Toluene-d8		2307	94		%		12/02/1999
SURR: Dibromofluoromethane		2307	112		%		12/02/1999
SURR: 4-Bromofluorobenzene		2307	99		%		12/02/1999

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QUALITY CONTROL REPORT
LABORATORY CONTROL STANDARD

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	LCS Conc Found	LCS % Rec.	LCS Dup. Conc Found	LCS Dup. % Rec.	RPD	Flag	Date Analyzed
VOLATILES-8260 (AQ)										
Benzene		2303	50.0	54.5	109					12/01/1999
Chlorobenzene		2303	50.0	49.8	100					12/01/1999
1,1-Dichloroethene		2303	50.0	40.1	80					12/01/1999
Toluene		2303	50.0	51.4	103					12/01/1999
Trichloroethene		2303	50.0	57.2	114					12/01/1999
SURR: Toluene-d8		2303	50.0	48.2	96					12/01/1999
SURR: Dibromofluoromethane		2303	50.0	51.9	104					12/01/1999
SURR: 4-Bromofluorobenzene		2303	50.0	50.1	100					12/01/1999

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QUALITY CONTROL REPORT
LABORATORY CONTROL STANDARD

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	LCS Conc Found	LCS % Rec.	LCS Dup. Conc Found	LCS Dup. % Rec.	RPD	Flag	Date Analyzed
VOLATILES-8260 (AQ)										
Benzene		2305	50.0	52.8	106					12/02/1999
Chlorobenzene		2305	50.0	48.5	97					12/02/1999
1,1-Dichloroethene		2305	50.0	35.7	71					12/02/1999
Toluene		2305	50.0	51.2	102					12/02/1999
Trichloroethene		2305	50.0	57.4	115					12/02/1999
SURR: Toluene-d8		2305	50.0	48.7	97					12/02/1999
SURR: Dibromofluoromethane		2305	50.0	52.5	105					12/02/1999
SURR: 4-Bromofluorobenzene		2305	50.0	49.1	98					12/02/1999

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QUALITY CONTROL REPORT
LABORATORY CONTROL STANDARD

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	LCS Conc Found	LCS % Rec.	LCS Dup. Conc Found	LCS Dup. % Rec.	RPD	Flag	Date Analyzed
VOLATILES-8260 (AQ)										
Benzene		2306	50.0	51.8	104					12/03/1999
Chlorobenzene		2306	50.0	47.0	94					12/03/1999
1,1-Dichloroethene		2306	50.0	51.5	103					12/03/1999
Toluene		2306	50.0	50.4	101					12/03/1999
Trichloroethene		2306	50.0	57.5	115					12/03/1999
SURR: Toluene-d8		2306	50.0	49.8	100					12/03/1999
SURR: Dibromofluoromethane		2306	50.0	54.0	108					12/03/1999
SURR: 4-Bromofluorobenzene		2306	50.0	48.6	97					12/03/1999

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QUALITY CONTROL REPORT
LABORATORY CONTROL STANDARD

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	LCS True Conc	LCS Conc Found	LCS % Rec.	LCS Dup. Conc Found	LCS Dup. % Rec.	RPD	Flag	Date Analyzed
VOLATILES-8260 (AQ)										
Benzene		2307	50.0	53.2	106	48.7	97	8.8		12/02/1999
Chlorobenzene		2307	50.0	48.3	97	45.5	91	6		12/02/1999
1,1-Dichloroethene		2307	50.0	58.0	116	51.7	103	12		12/02/1999
Toluene		2307	50.0	49.9	100	46.6	93	6.8		12/02/1999
Trichloroethene		2307	50.0	51.1	102	49.9	100	2.4		12/02/1999
SURR: Toluene-d8		2307	50.0	47.6	95	48.5	97	1.9		12/02/1999
SURR: Dibromofluoromethane		2307	50.0	58.3	117	53.4	107	8.8		12/02/1999
SURR: 4-Bromofluorobenzene		2307	50.0	49.4	99	49.0	98	0.8		12/02/1999

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QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Conc. Spike Added	Sample Result	Conc. MS Result	MS % Rec.	Conc. MSD Result	MSD % Rec.	RPD	Flag	Date Analyzed	Sample Spiked
VOLATILES-8260 (AQ)												253788
Benzene		2303	50.0	<5.0	49.2	98	47.2	94	4.1		12/01/1999	253788
Chlorobenzene		2303	50.0	<5.0	44.7	89	43.3	87	3.2		12/01/1999	253788
1,1-Dichloroethene		2303	50.0	<5.0	52.4	105	46.3	93	12		12/01/1999	253788
Toluene		2303	50.0	<5.0	47.1	94	44.8	90	5		12/01/1999	253788

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QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Conc. Spike Added	Sample Result	Conc. MS Result	MS % Rec.	Conc. MSD Result	MSD % Rec.	RPD	Flag	Date Analyzed	Sample Spiked
VOLATILES-8260 (AQ)												253799
Benzene		2305	50.0	<5.0	45.6	91	42.7	85	6.6		12/02/1999	253799
Chlorobenzene		2305	50.0	<5.0	41.6	83	39.7	79	4.7		12/02/1999	253799
1,1-Dichloroethene		2305	50.0	<5.0	44.6	89	47.2	94	5.7		12/02/1999	253799
Toluene		2305	50.0	<5.0	43.3	87	42.9	86	0.9		12/02/1999	253799
Trichloroethene		2305	50.0	<5.0	46.9	94	44.0	88	6.4		12/02/1999	253799

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QUALITY CONTROL REPORT
MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Mr. Frank West
KERAMIDA ENVIRONMENTAL
330 North College Avenue
Indianapolis, IN 46202

12/08/1999

Job Number: 99.06819

Analyte	Prep Batch No.	Run Batch No.	Conc. Spike Added	Sample Result	Conc. MS Result	MS % Rec.	Conc. MSD Result	MSD % Rec.	RPD	Flag	Date Analyzed	Sample Spiked
VOLATILES-8260 (AQ)												253809
Benzene		2307	50.0	<5.0	71.8	144	53.6	107	29	q	12/02/1999	253809
Chlorobenzene		2307	50.0	<5.0	62.3	125	46.8	94	28	q	12/02/1999	253809
1,1-Dichloroethene		2307	50.0	<5.0	76.9	154	59.4	119	26	q	12/02/1999	253809
Toluene		2307	50.0	<5.0	68.7	137	49.7	99	32	q	12/02/1999	253809
Trichloroethene		2307	50.0	<5.0	72.4	145	53.3	107	30	q	12/02/1999	253809

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PROJECT NARRATIVE

JOB NUMBER: 99.06819

SAMPLE: 253809 MS/MSD

ANALYSIS: VOA - 8260(aq.)

The matrix spike recovery was above statitical limits. The laboratory spike and spike duplicate are reported for additional precision data.

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KEY TO ABBREVIATIONS

<	Less than; when appearing in the result column, indicates analyte not detected at or above the Reporting Limit.
%	Percent; To convert ppm to %, divide result by 10,000. To convert % to ppm, multiply the result by 10,000.
*	Indicates the Reporting Limit is elevated due to insufficient sample volume.
mg/L	Part per million; Concentration in units of milligrams of analyte per Liter of aqueous sample.
ug/L	Part per billion; Concentration in units of micrograms of analyte per Liter of aqueous sample.
mg/kg	Part per million; Concentration in units of milligrams of analyte per kilogram of non-aqueous sample.
ug/kg	Part per billion; Concentration in units of micrograms of analyte per kilogram of non-aqueous sample.
a	Indicates the sample concentration was quantitated using a diesel fuel standard.
b	Indicates the analyte of interest was also found in the method blank.
c	Sample resembles unknown Hydrocarbon.
dw	When indicated, the result is reported on a dry weight basis. The contribution of the moisture content in the sample has been subtracted when calculating the concentration.
d1	Indicates the analyte has elevated Reporting Limit due to high concentration.
d2	Indicates the analyte has elevated Reporting Limit due to matrix.
e	Indicates the reported concentration is estimated.
f	Indicates the sample concentration was quantitated using a fuel oil standard.
g	Indicates the sample concentration was quantitated using a gasoline standard.
h	Indicates the sample was analyzed past recommended holding time.
i	Insufficient spike concentration due to high analyte concentration in the sample.
j	Indicates the reported concentration is below the Reporting Limit.
k	Indicates the sample concentration was quantitated using a kerosene standard.
l	Indicates an MS/MSD was not analyzed due to insufficient sample. An LCS / LCS Duplicate provided for precision.
m	Indicates the sample concentration was quantitated using a mineral spirits standard.
o	Indicates the sample concentration was quantitated using a motor oil standard.
p	Indicates the sample was post spiked due to sample matrix.
q	Indicates MS/MSD exceeded control limits. All other Quality Control Indicators were in control.
r	Indicates the sample was received past recommended holding time.
s	Indicates the sample concentration was quantitated using a stoddard solvent standard.
u	Indicates the sample was received improperly preserved and/or imporperly contained.
uj	Indicates the result is below the Reporting Limit and is considered estimated.

KERAMIDA ENVIRONMENTAL, INC.
330 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - FAX (317) 685-6610

CHAIN OF CUSTODY RECORD

Sheet 1 of 3

Project No.: 2829
Project Name: Genuine Parts
Report to: Frank West
Client:
Samplers: (signature)
Sampled By: KERAMIDA Environmental, Inc.

Sample ID/Description	Date	Time	Comp	Grab	HCl	NaOH	HNO_3	H_2SO_4	Other	VOCs (8260)	MATRIX SW GW WW Soil Air Waste Oil	QA/QC Level	Detection Level	Comments
MW-101	11/23	12:15	-	X	3					X	GW	II		
MW-154		9:45		X	3					X				
MW-147		14:45		X	3					X				
MW-132		9:55		X	3					X				
MW-148		14:20		X	3					X				
MW-155		14:50		X	3					X				
MW-158		15:15		X	3					X				
MW-302		9:25		X	3					X				
MW-153		8:35		X	3					X				
MW-202		9:05		X	3					X				
MW-133		10:15		X	3					X				
MW-145		13:00		X	3					X				
MW-146		12:40		X	3					X				

Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time
11/24/99 10:31	11/24/99 1030	11/24/99 1605	11/24 1605
Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time

Remarks:

1) No method substitution will be performed by the laboratory without KERAMIDA authorization
2) Please notify KERAMIDA immediately upon receipt, if sample integrity is in question
3) If analysis cannot be conducted within required holding times, please notify KERAMIDA immediately
4) If requested detection lmits cannot be achieved, please contact KERAMIDA immediately

Sample Condition:
Bottle Intact? Yes/No
Field Filtered? Yes/No
COC Seals Present & Intact? ~~Yes/No~~ N/A
VOC Free of Headspace? Yes/No
VOC Preserved? Yes/No
Temperature upon Receipt: 5.3°C

KERAMIDA ENVIRONMENTAL, INC.
330 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - FAX (317) 685-6610

CHAIN OF CUSTODY RECORD

Project No.: 2829
Project Name: Genuine Parts
Report to: Frank West
Client:
Samplers: (signature)
Sampled By: KERAMIDA Environmental, Inc.

Sample ID/Description	Date	Time	Comp	Grab	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	Other	Analyses: VOC's (8260)	MATRIX (SW, GW, WW, Soil, Air, Waste Oil)	QA/QC Level	Detection Level	Comments
MW-152	11/23/99	14:00	-	X	3					X	GW	II		
MW-135		10:25		X	3					X				
MW-150		10:50		X	3					X				
MW-200		13:30		X	3					X				
OB-1		12:10		X	3					X				
OB-2		12:20		X	3					X				
MW-156		16:00		X	3					X				
MW-301		15:50		X	3					X				
MW-151		15:45		X	3					X				
MW-201		18:15		X	3					X				
~~[illegible]~~ TRIP BLANK	11/23/99			X	3					X				
MW-101D	11/23/99	12:15		X	3					X				
MW-145D	11/23/99	13:00		X	3					X				

Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time
11/24/99 10:30	11/24/99 1030	11/24/99 1605	11/24 1605
Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time

Remarks:
1) No method substitution will be performed by the laboratory without KERAMIDA authorization
2) Please notify KERAMIDA immediately upon receipt, if sample integrity is in question
3) If analysis cannot be conducted within required holding times, please notify KERAMIDA immediately
4) If requested detection limits cannot be achieved, please contact KERAMIDA immediately

Sample Condition:
Bottle Intact? Yes/No
Field Filtered? Yes/No
COC Seals Present & Intact? ~~Yes/No~~ N/A
VOC Free of Headspace? Yes/No
VOC Preserved? Yes/No
Temperature upon Receipt: 5.3°C

KERAMIDA ENVIRONMENTAL, INC.
330 North College Avenue
Indianapolis, Indiana 46202
(317) 685-6600 - FAX (317) 685-6610

CHAIN OF CUSTODY RECORD

Sheet 3 of 3

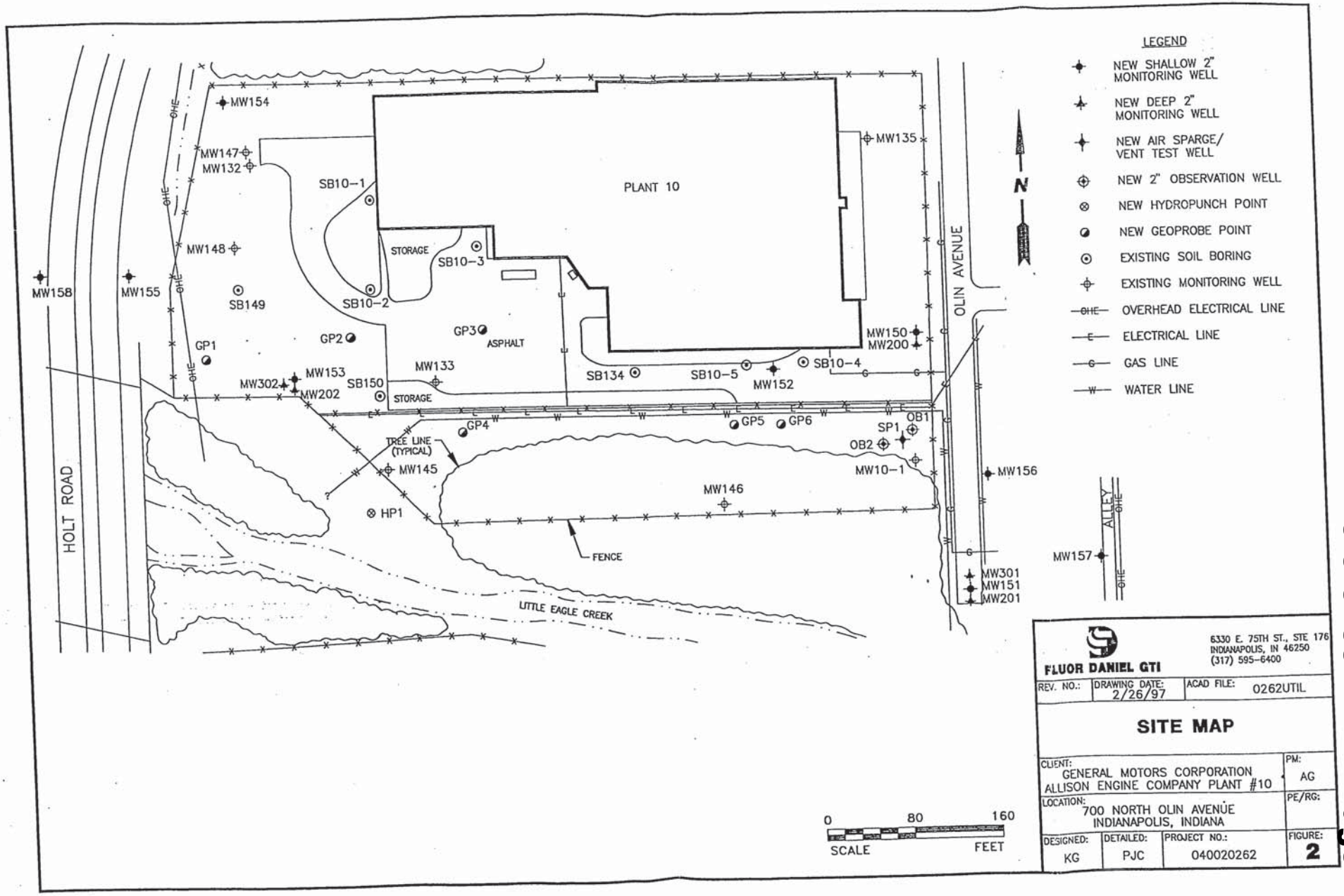
Project No.: 2829
Project Name: Genuine Parts
Report to: Frank West
Client:
Samplers: (signature)
Sampled By: KERAMIDA Environmental, Inc.

Sample ID/Description	Date	Time	Comp	Grab	# and Type of Containers: HCl	NaOH	HNO_3	H_2SO_4	Other	Analyses: VOCs (8260)	MATRIX (SW, GW, WW, Soil, Air, Waste, Oil)	QA/QC Level	Detection Level	Comments
MW-200D	11/23/99	13:30		X	3					X	GW	II		
MW-10-1/MS		12:15		X	3					X				
MW-10-1/MS-MSD		12:15		X	3					X				
MW-145 MS		13:00		X	3					X				
MW-145 MSD		13:00		X	3					X				

Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time
11/24/99 10:30	ME Milliken 11/24/99 1030	ME Milliken 11/24/99 1605	11/24 1605
Relinquished by: Sign/Date/Time	Received by: Sign/Date/Time	Relinquished by: Sign/Date/Time	Received for Lab: Sign/Date/Time

Remarks:
1) No method substitution will be performed by the laboratory without KERAMIDA authorization
2) Please notify KERAMIDA immediately upon receipt, if sample integrity is in question
3) If analysis cannot be conducted within required holding times, please notify KERAMIDA immediately
4) If requested detection limits cannot be achieved, please contact KERAMIDA immediately

Sample Condition:
Bottle Intact? Yes/No
Field Filtered? Yes/No
COC Seals Present & Intact? ~~Yes/No~~ N/A
VOC Free of Headspace? Yes/No
VOC Preserved? Yes/No
Temperature upon Receipt: 5.3°C



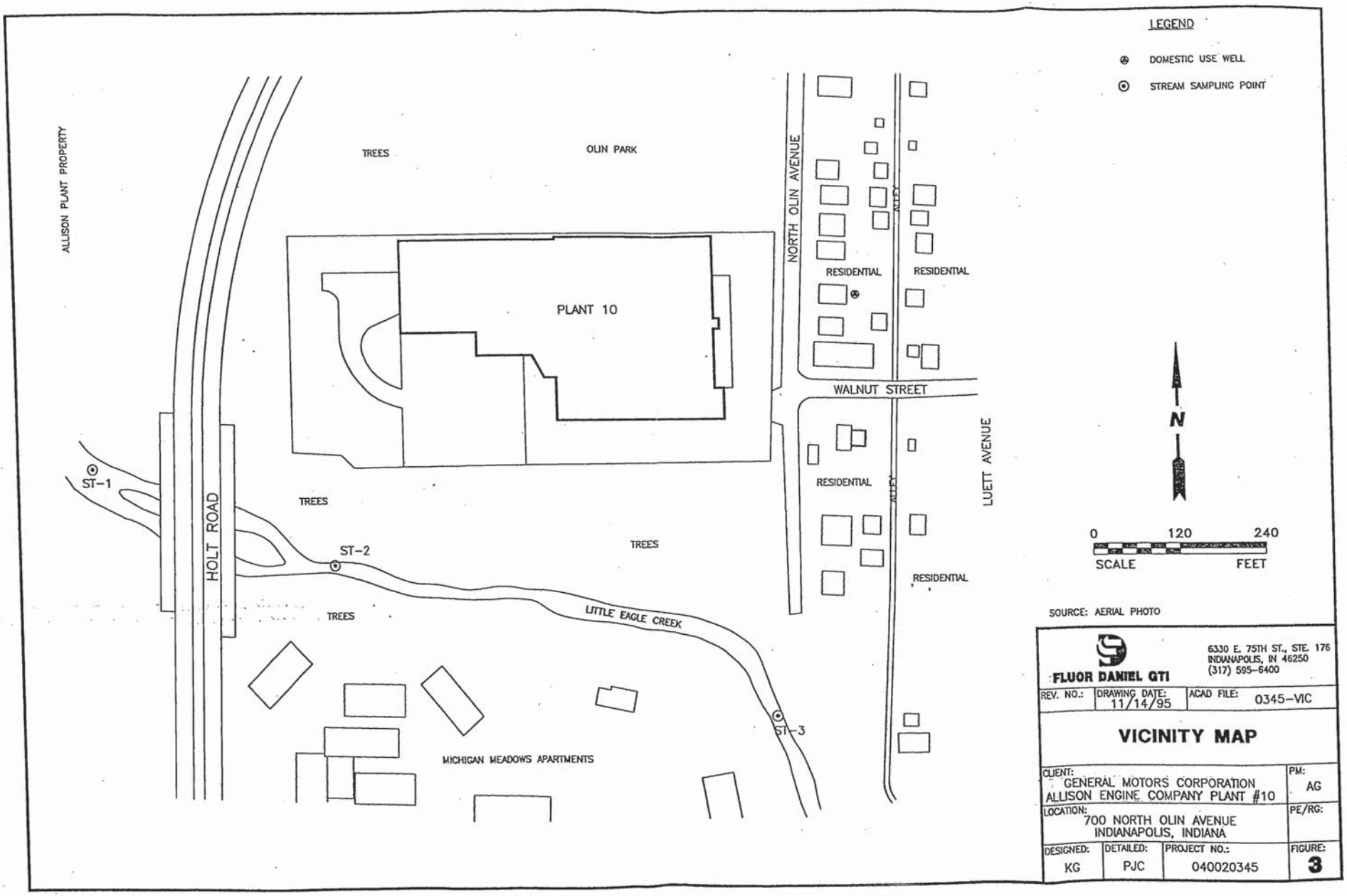
FLUOR DANIEL GTI

6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. NO.:	DRAWING DATE: 2/26/97	ACAD FILE: 0262UTIL

SITE MAP

CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10			PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA			PE/RG:
DESIGNED: KG	DETAILED: PJC	PROJECT NO.: 040020262	FIGURE: 2


LEGEND
DOMESTIC USE WELL
STREAM SAMPLING POINT
ALLISON PLANT PROPERTY
TREES
OLIN PARK
PLANT 10
NORTH OLIN AVENUE
ALLEY
RESIDENTIAL
RESIDENTIAL
WALNUT STREET
RESIDENTIAL
LUETT AVENUE
RESIDENTIAL
ST-1
HOLT ROAD
TREES
ST-2
TREES
TREES
LITTLE EAGLE CREEK
ST-3
MICHIGAN MEADOWS APARTMENTS
N
0
120
240
SCALE
FEET
SOURCE: AERIAL PHOTO
FLUOR DANIEL GTI
6330 E. 75TH ST., STE. 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 11/14/95
ACAD FILE: 0345-VIC
VICINITY MAP
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: KG
DETAILED: PJC
PROJECT NO.: 040020345
FIGURE: 3

LEGEND

● 140 DOMESTIC WELL

▲ HIGH CAPACITY WELL

SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE
INDIANAPOLIS WEST, INDIANA (1980)
CLERMONT, INDIANA (1980)

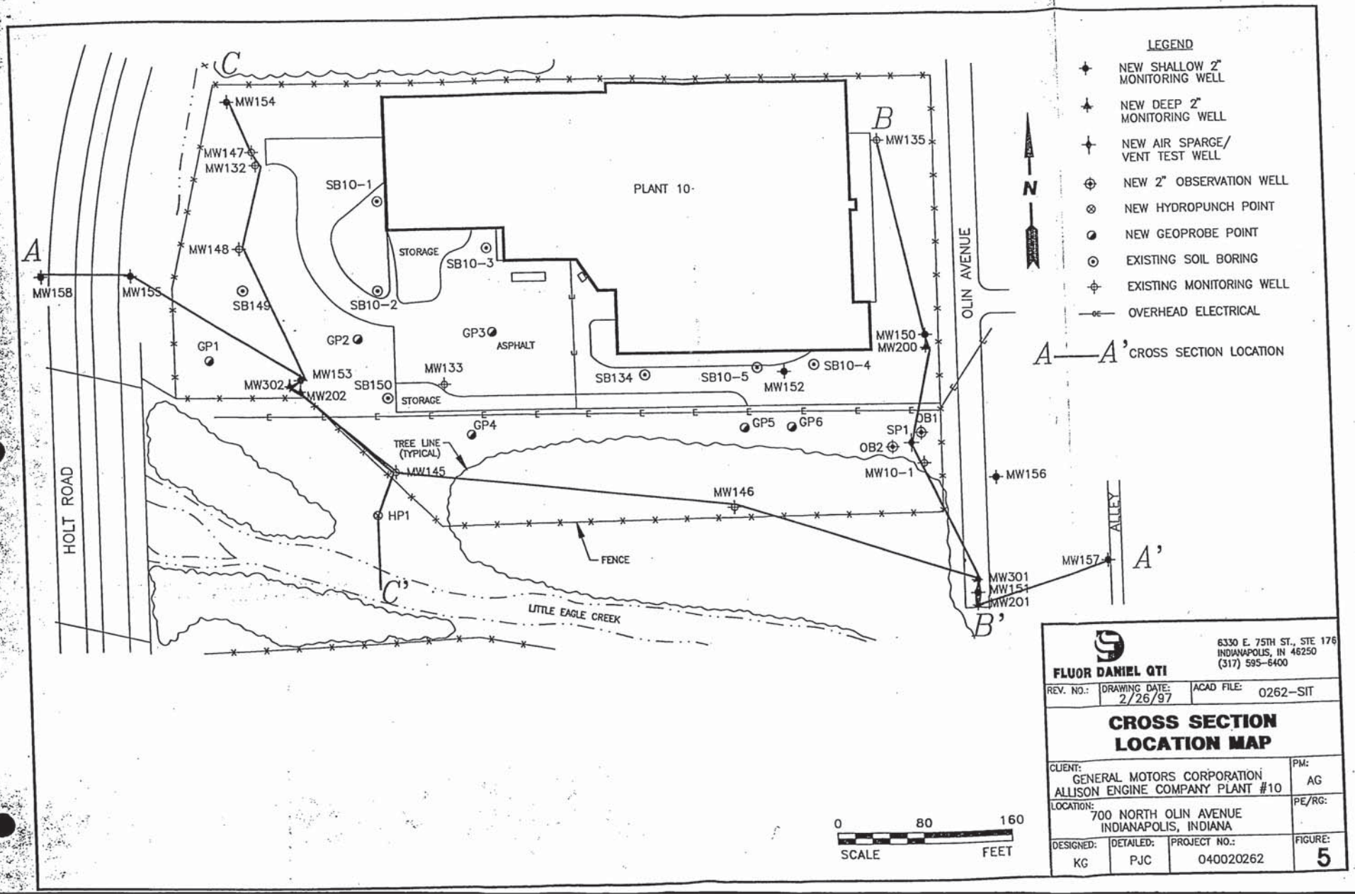
SCALE 1:24,000

0 1/2 1 MILE

0 2,000 4,000
SCALE FEET

FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. NO.:	DRAWING DATE: 11/7/95	ACAD FILE: 0345-MWL	
DOMESTIC/MUNICIPAL WELL LOCATION MAP			
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT 10			PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA			PE/RG:
DESIGNED: KG	DETAILED: KG	PROJECT NO.: 04002-0345	FIGURE: 4



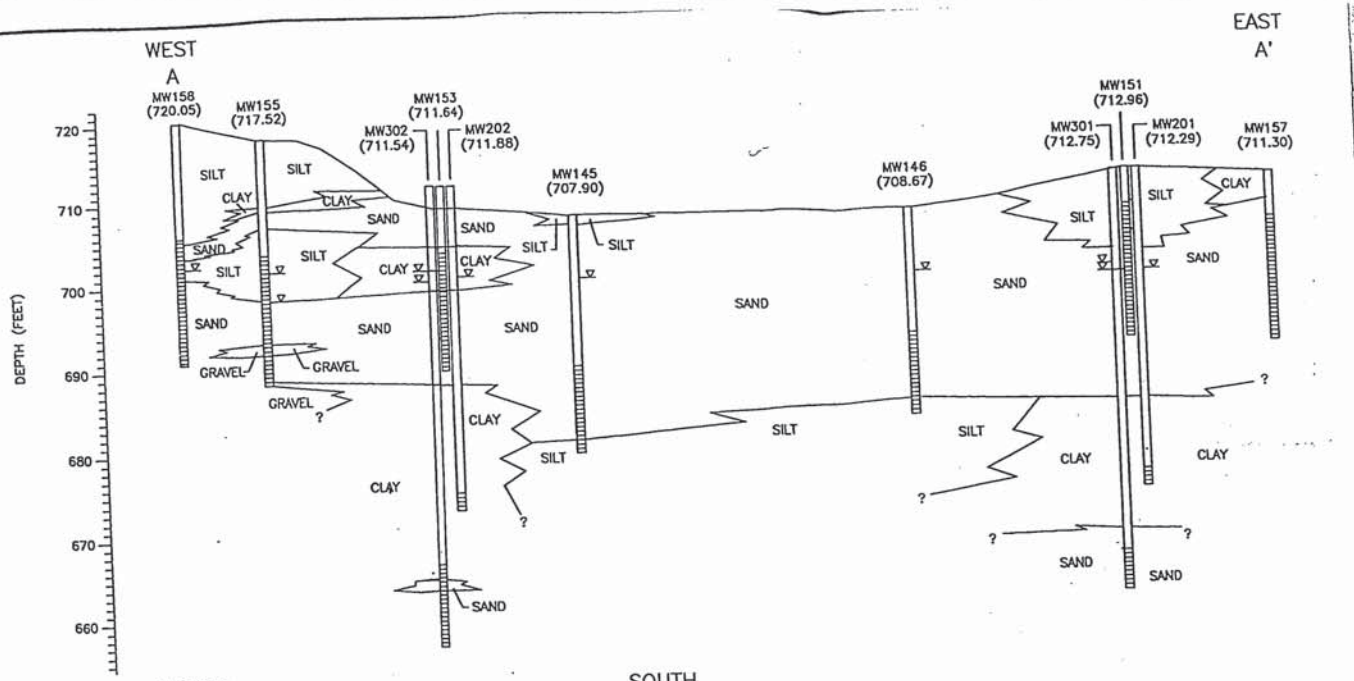
FLUOR DANIEL GTI

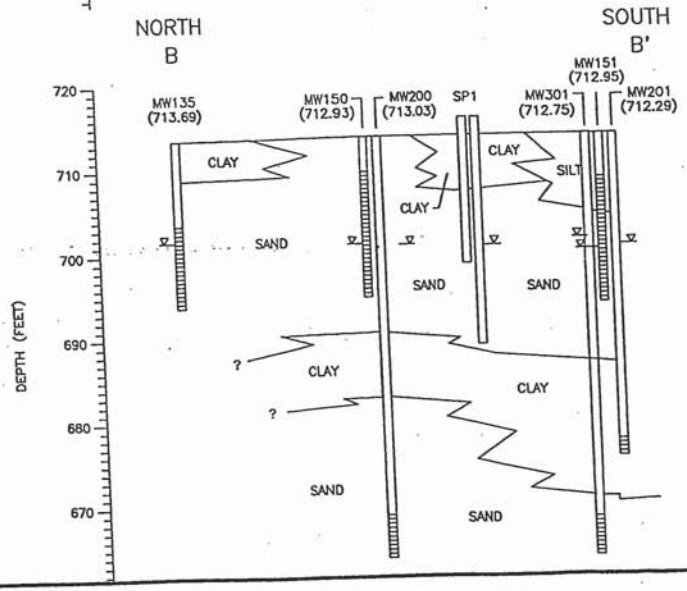
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. NO.:	DRAWING DATE: 2/26/97	ACAD FILE: 0262-SIT

CROSS SECTION LOCATION MAP

CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10			PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA			PE/RG:
DESIGNED: KG	DETAILED: PJC	PROJECT NO.: 040020262	FIGURE: 5





LEGEND

WELL CASING

WELL SCREEN

STATIC WATER LEVEL (FEBRUARY 1997)

(720.05) SURVEYED ELEVATION TOP OF CASING

VERTICAL SCALE AS SHOWN

0 120 240

HORIZONTAL SCALE FEET

SOURCE: GEOLOGIST SKETCH

FLUOR DANIEL GTI

6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. DATE: 3/5/97	DRAWING DATE: 11/14/95	ACAD FILE: 0345XSEC

CROSS SECTIONS A-A' AND B-B'

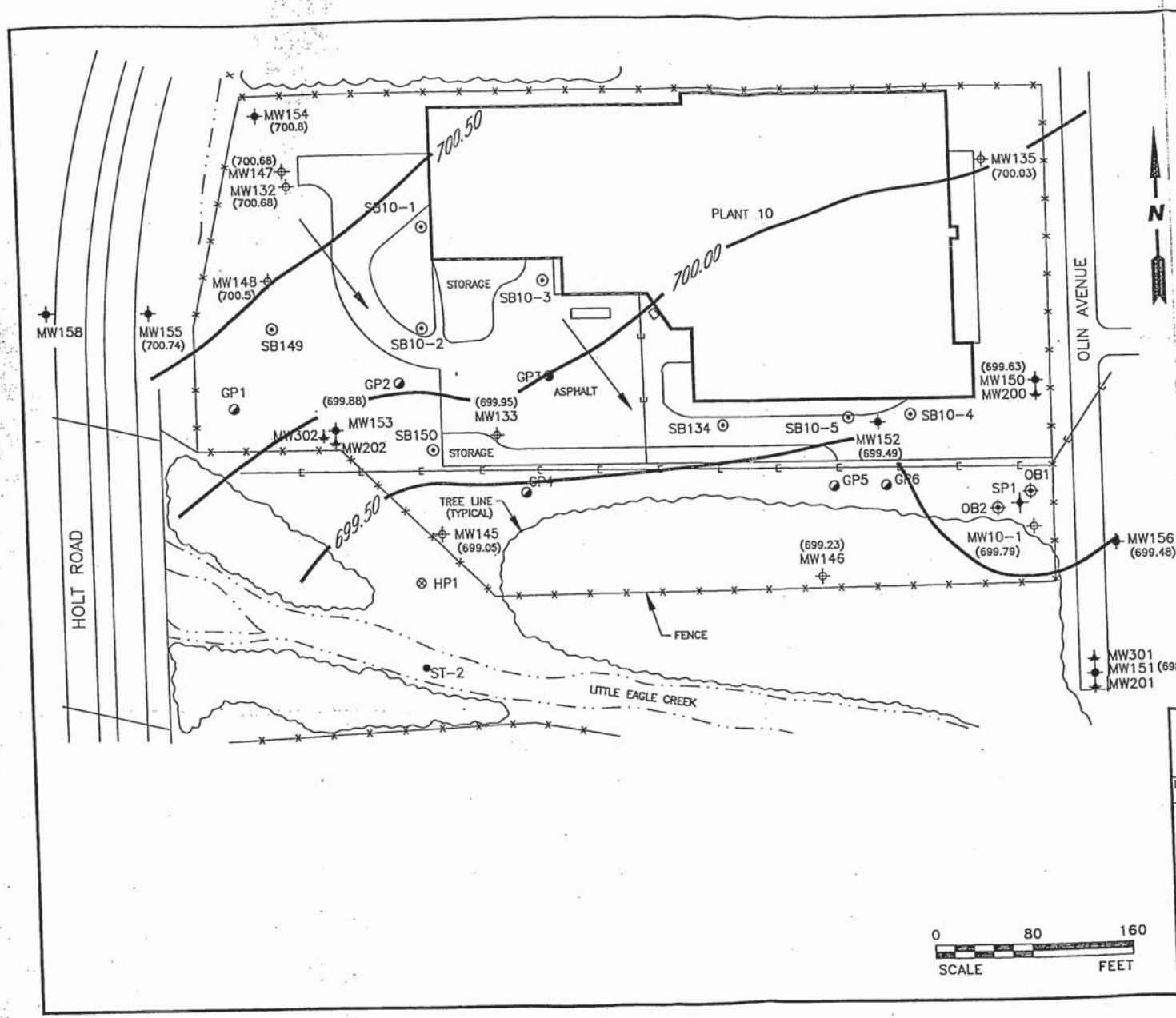
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10

PM:

LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA

PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
KG	PJC	040020345	5A



LEGEND

- NEW SHALLOW 2" MONITORING WELL
- NEW DEEP 2" MONITORING WELL
- NEW AIR SPARGE/ VENT TEST WELL
- NEW 2" OBSERVATION WELL
- NEW HYDROPUNCH POINT
- NEW GEOPROBE POINT
- EXISTING SOIL BORING
- EXISTING MONITORING WELL
- OVERHEAD ELECTRICAL
- (700.03) GROUNDWATER ELEVATION (ft.)
- GROUNDWATER CONTOUR LINE
- INTERPRETED DIRECTION OF GROUNDWATER FLOW

CONTOUR INTERVAL=0.50 FEET

FLUOR DANIEL GTI

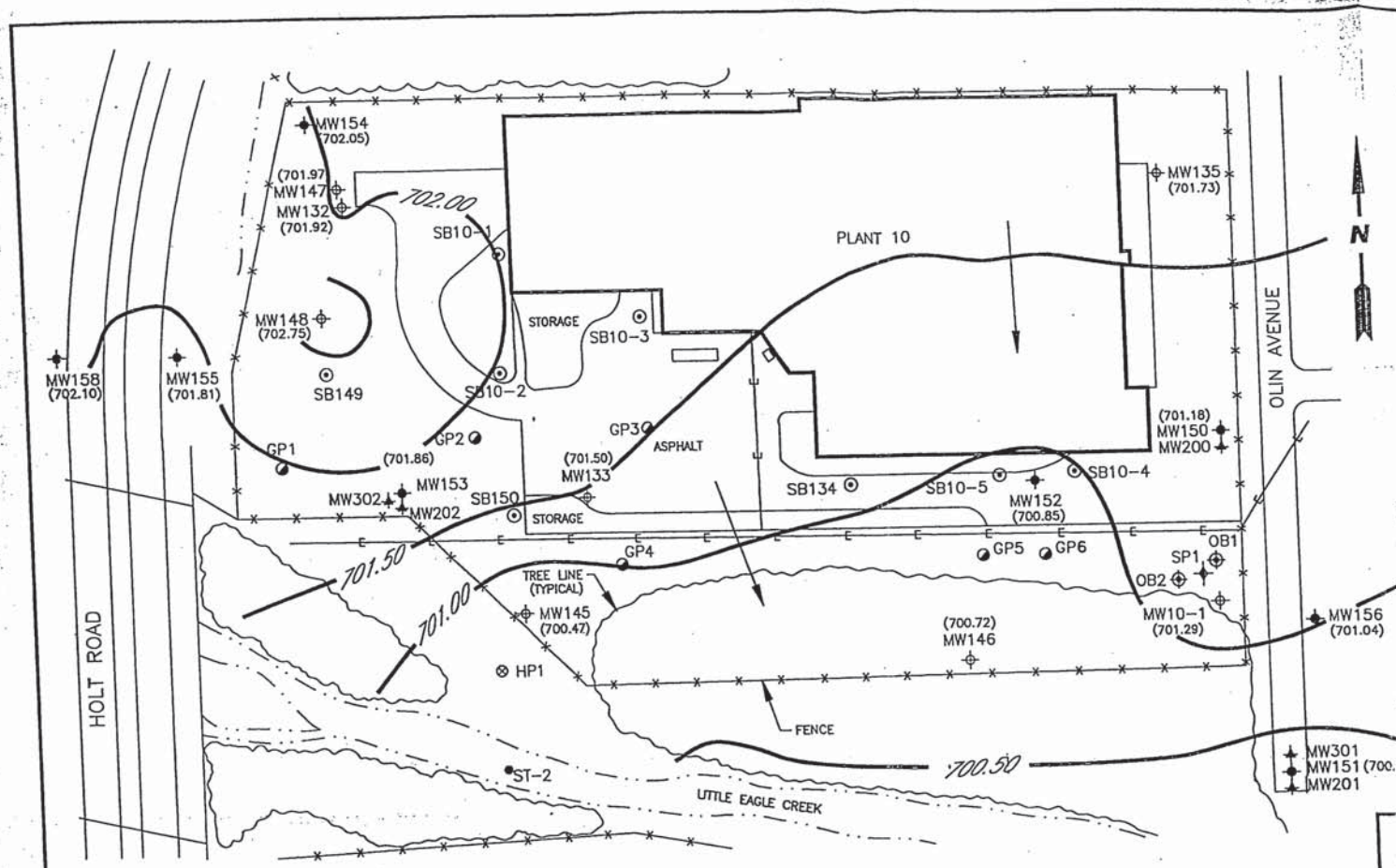
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. NO.:	DRAWING DATE: 2/26/97	ACAD FILE: 0262-SIT	

POTENTIOMETRIC SURFACE MAP

SEPTEMBER 1995

CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10			PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA			PE/RG:
DESIGNED: KG	DETAILED: PJC	PROJECT NO.: 010210262	FIGURE: 6B



LEGEND

- NEW SHALLOW "2" MONITORING WELL
- NEW DEEP "2" MONITORING WELL
- NEW AIR SPARGE/ VENT TEST WELL
- NEW 2" OBSERVATION WELL
- NEW HYDROPUNCH POINT
- NEW GEOPROBE POINT
- EXISTING SOIL BORING
- EXISTING MONITORING WELL
- OVERHEAD ELECTRICAL
- (701.73) GROUNDWATER ELEVATION (ft.)
- GROUNDWATER CONTOUR LINE
- INTERPRETED DIRECTION OF GROUNDWATER FLOW
- CONTOUR INTERVAL=0.50 FEET

FLUOR DANIEL GTI

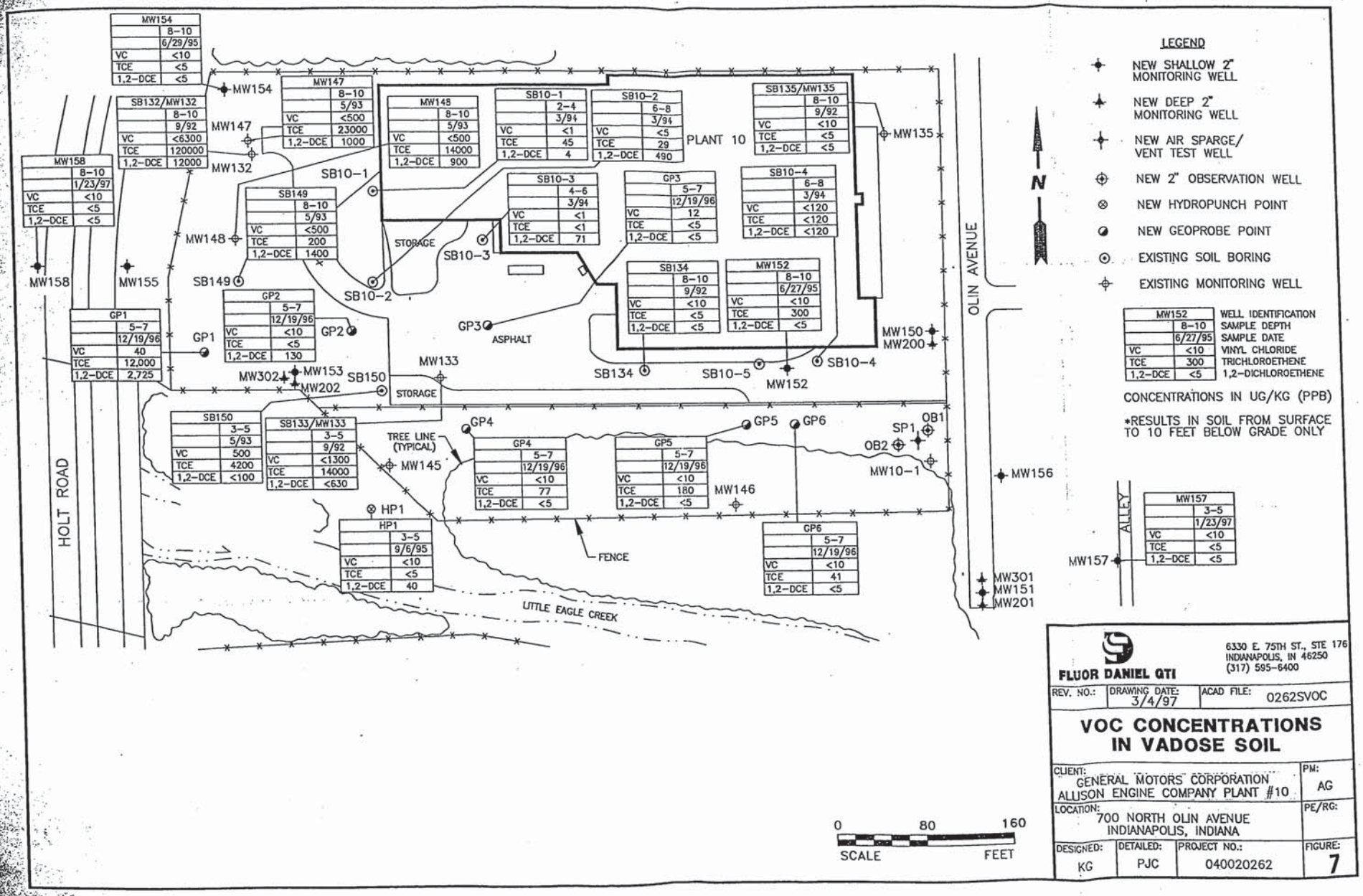
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400

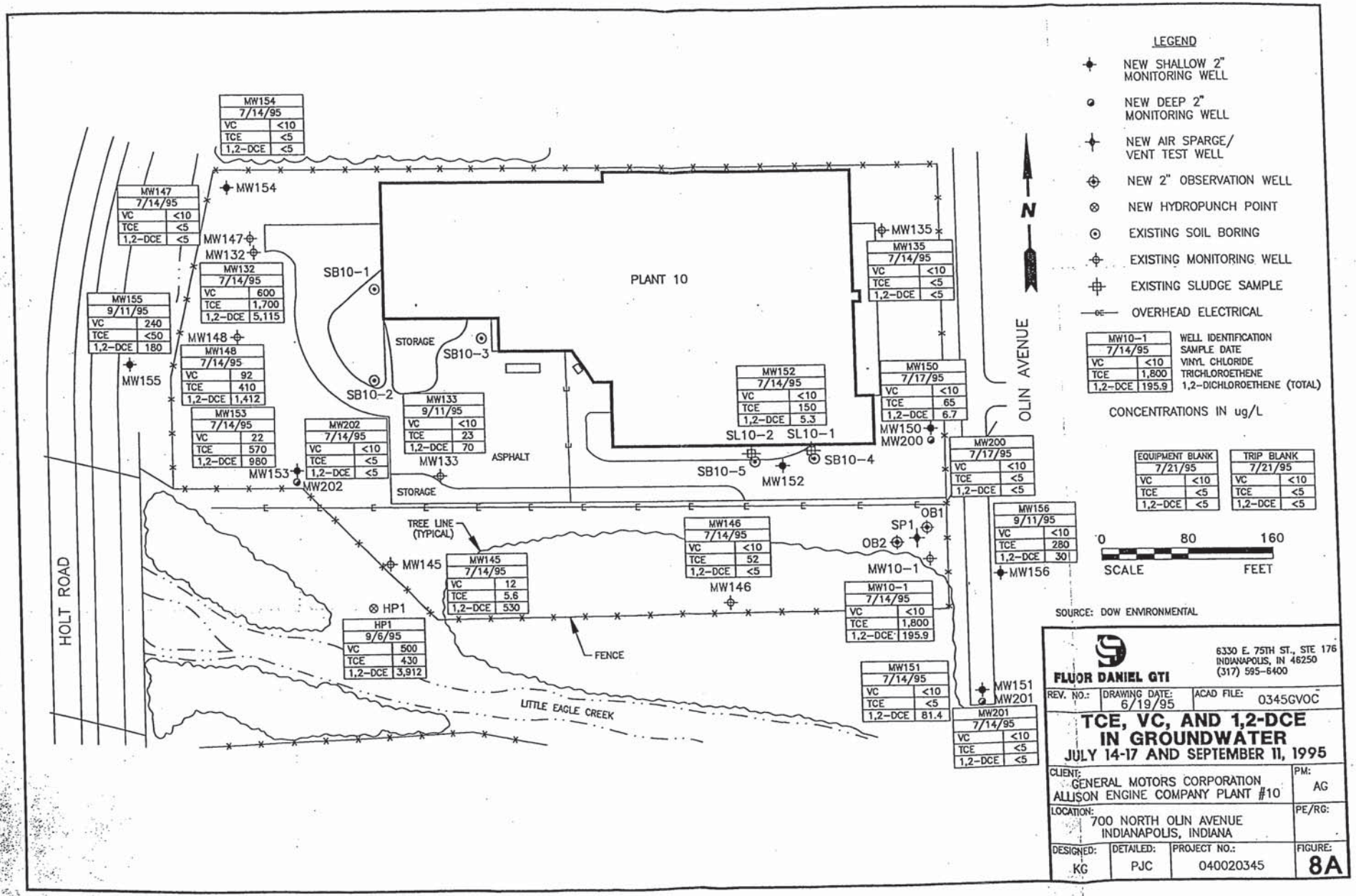
REV. NO.:	DRAWING DATE: 2/26/97	ACAD FILE: 0262-SIT

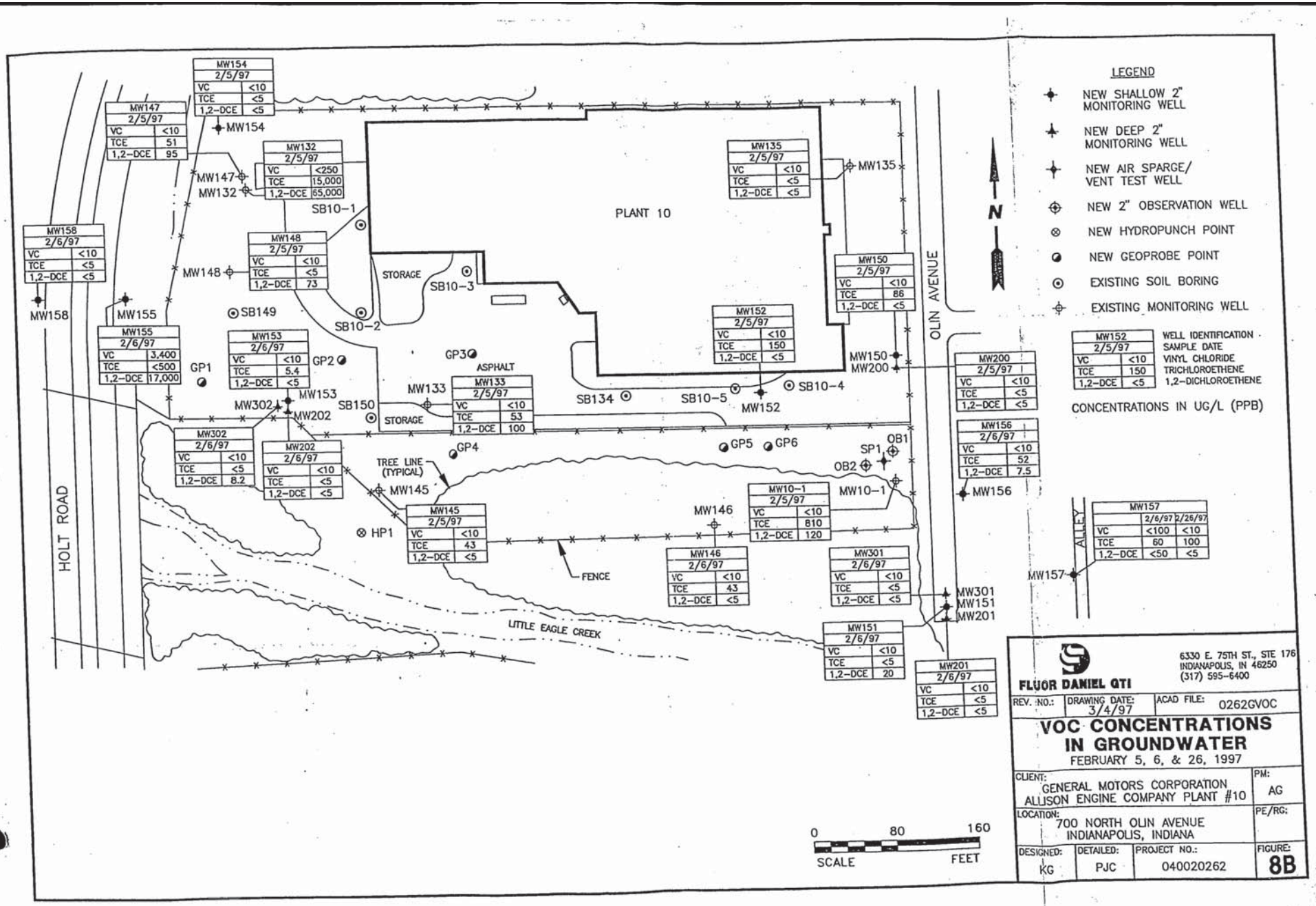
POTENTIOMETRIC SURFACE MAP

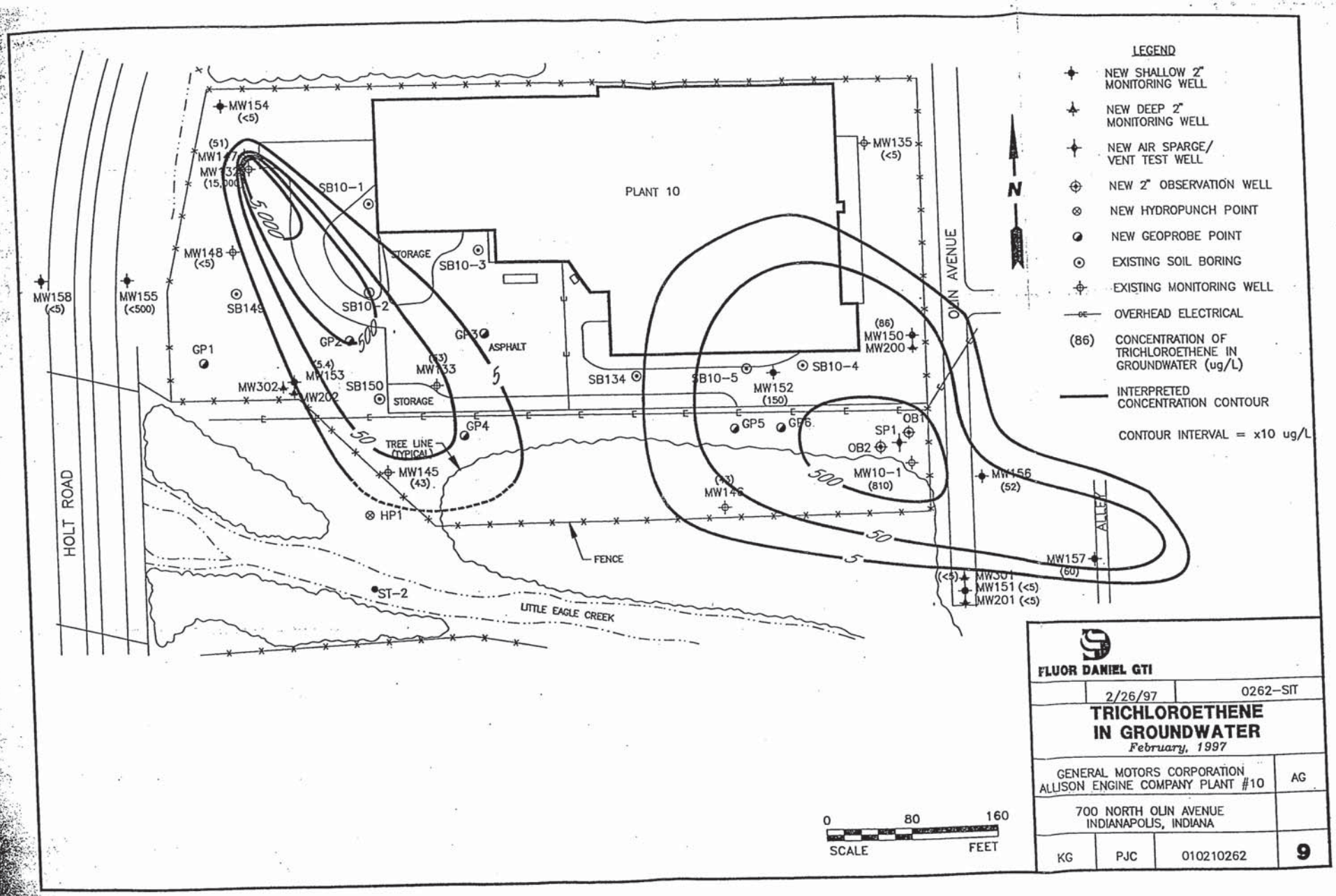
FEBRUARY 1997

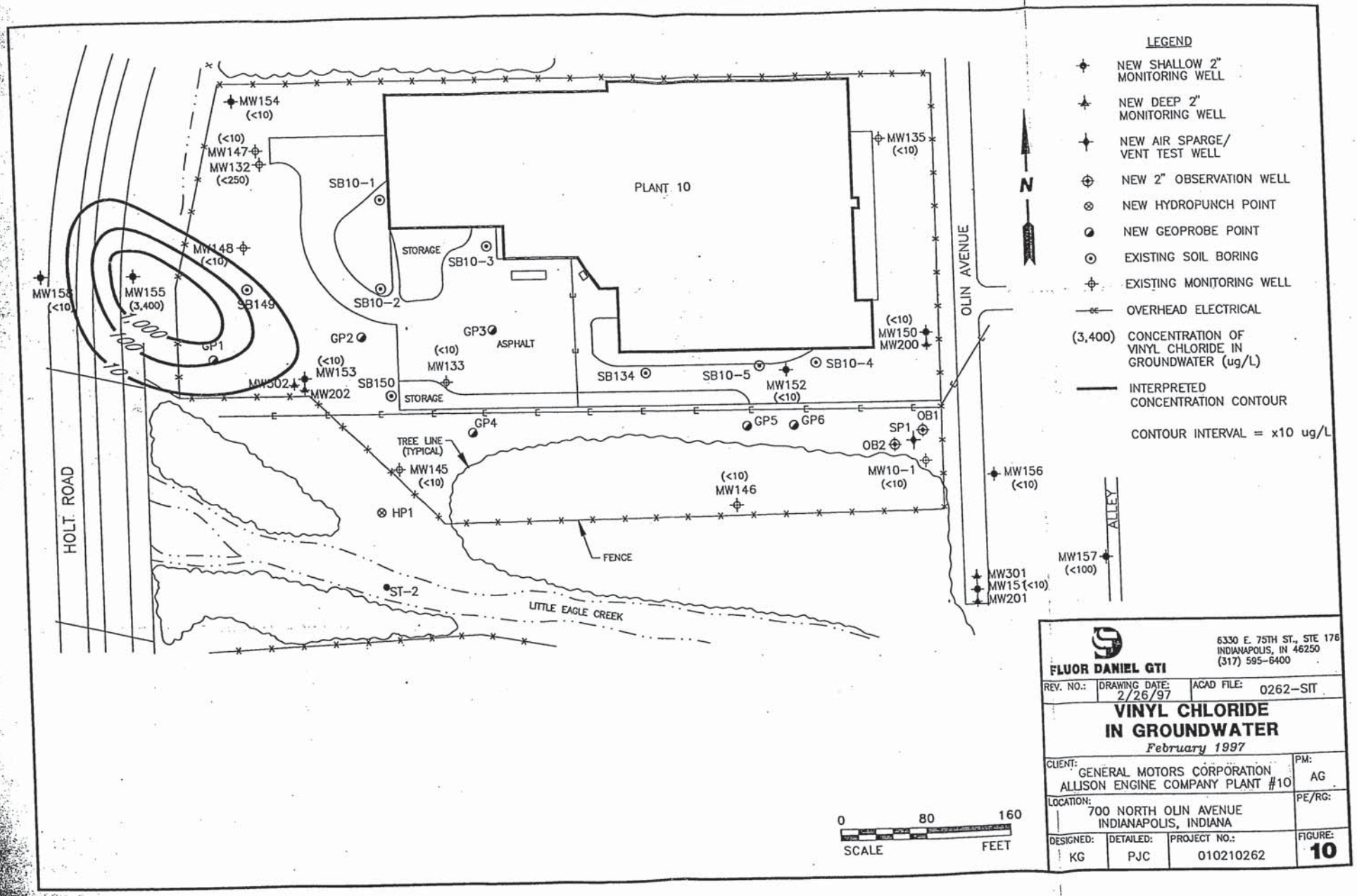
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10			PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA			PE/RG:
DESIGNED: KG	DETAILED: PJC	PROJECT NO.: 010210262	FIGURE: 6C

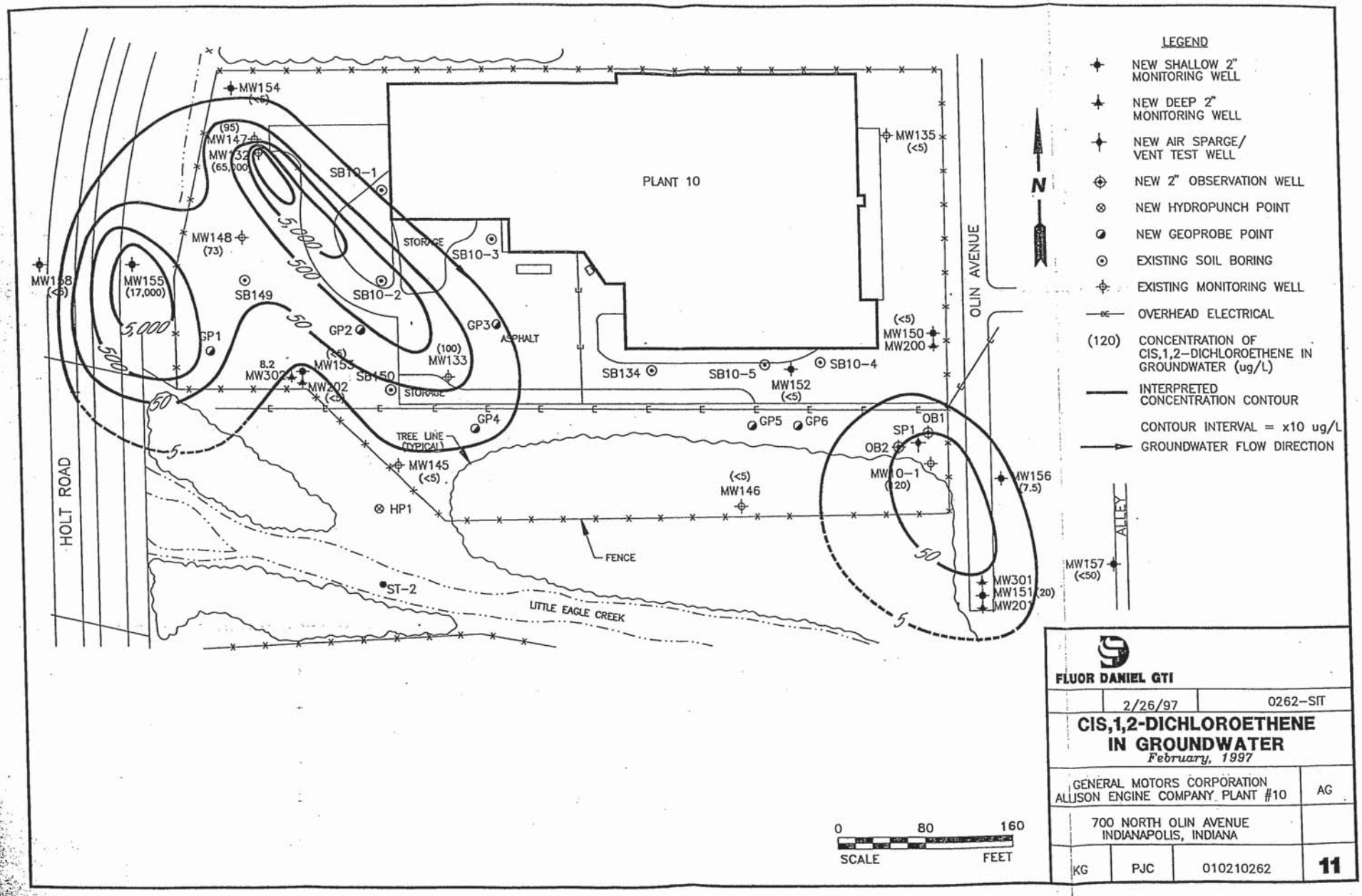

MW154
8-10
6/29/95
VC <10
TCE <5
1,2-DCE <5
MW154
SB132/MW132
8-10
9/92
VC <6300
TCE 120000
1,2-DCE 12000
MW147
MW132
MW147
8-10
5/93
VC <500
TCE 23000
1,2-DCE 1000
MW148
8-10
5/93
VC <500
TCE 14000
1,2-DCE 900
SB10-1
2-4
3/94
VC <1
TCE 45
1,2-DCE 4
SB10-2
6-8
3/94
VC <5
TCE 29
1,2-DCE 490
PLANT 10
SB135/MW135
8-10
9/92
VC <10
TCE <5
1,2-DCE <5
MW135
MW158
8-10
1/23/97
VC <10
TCE <5
1,2-DCE <5
SB149
8-10
5/93
VC <500
TCE 200
1,2-DCE 1400
SB10-3
4-6
3/94
VC <1
TCE <1
1,2-DCE 71
GP3
5-7
12/19/96
VC 12
TCE <5
1,2-DCE <5
SB10-4
6-8
3/94
VC <120
TCE <120
1,2-DCE <120
MW148
STORAGE
SB10-3
MW158
MW155
SB149
SB10-2
SB134
8-10
9/92
VC <10
TCE <5
1,2-DCE <5
MW152
8-10
6/27/95
VC <10
TCE 300
1,2-DCE <5
GP2
5-7
12/19/96
VC <10
TCE <5
1,2-DCE 130
GP1
5-7
12/19/96
VC 40
TCE 12,000
1,2-DCE 2,725
GP1
GP2
GP3
ASPHALT
MW150
MW200
OLIN AVENUE
MW302
MW153
MW202
SB150
MW133
STORAGE
SB134
SB10-5
MW152
SB10-4
SB150
3-5
5/93
VC 500
TCE 4200
1,2-DCE <100
SB133/MW133
3-5
9/92
VC <1300
TCE 14000
1,2-DCE <630
TREE LINE (TYPICAL)
MW145
GP4
GP4
5-7
12/19/96
VC <10
TCE 77
1,2-DCE <5
GP5
5-7
12/19/96
VC <10
TCE 180
1,2-DCE <5
GP5
GP6
SP1
OB1
OB2
MW10-1
MW156
MW146
HOLT ROAD
HP1
HP1
3-5
9/6/95
VC <10
TCE <5
1,2-DCE 40
FENCE
GP6
5-7
12/19/96
VC <10
TCE 41
1,2-DCE <5
MW301
MW151
MW201
LITTLE EAGLE CREEK
ALLEY
MW157
MW157
3-5
1/23/97
VC <10
TCE <5
1,2-DCE <5
N
LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
NEW GEOPROBE POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
MW152 WELL IDENTIFICATION
8-10 SAMPLE DEPTH
6/27/95 SAMPLE DATE
VC <10 VINYL CHLORIDE
TCE 300 TRICHLOROETHENE
1,2-DCE <5 1,2-DICHLOROETHENE
CONCENTRATIONS IN UG/KG (PPB)
*RESULTS IN SOIL FROM SURFACE TO 10 FEET BELOW GRADE ONLY
0 80 160
SCALE FEET
FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 3/4/97
ACAD FILE: 0262SVOC
VOC CONCENTRATIONS IN VADOSE SOIL
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: KG
DETAILED: PJC
PROJECT NO.: 040020262
FIGURE: 7

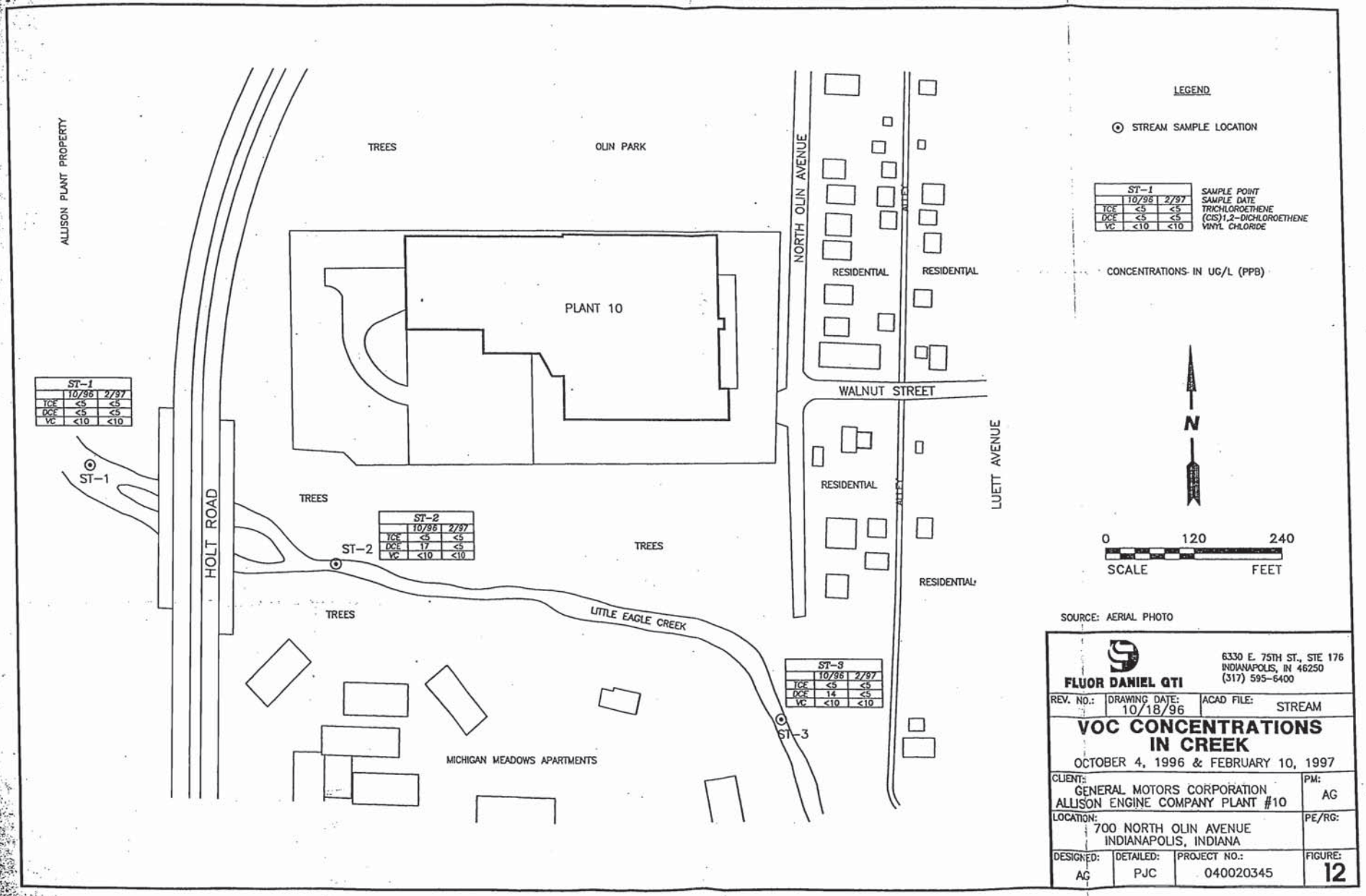

LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
EXISTING SLUDGE SAMPLE
OVERHEAD ELECTRICAL
MW10-1 WELL IDENTIFICATION
7/14/95 SAMPLE DATE
VC <10 VINYL CHLORIDE
TCE 1,800 TRICHLOROETHENE
1,2-DCE 195.9 1,2-DICHLOROETHENE (TOTAL)
CONCENTRATIONS IN ug/L
EQUIPMENT BLANK 7/21/95 VC <10 TCE <5 1,2-DCE <5
TRIP BLANK 7/21/95 VC <10 TCE <5 1,2-DCE <5
0 80 160
SCALE FEET
SOURCE: DOW ENVIRONMENTAL
N
PLANT 10
OLIN AVENUE
HOLT ROAD
LITTLE EAGLE CREEK
STORAGE
ASPHALT
TREE LINE (TYPICAL)
FENCE
MW154 7/14/95 VC <10 TCE <5 1,2-DCE <5
MW147 7/14/95 VC <10 TCE <5 1,2-DCE <5
MW132 7/14/95 VC 600 TCE 1,700 1,2-DCE 5,115
MW155 9/11/95 VC 240 TCE <50 1,2-DCE 180
MW148 7/14/95 VC 92 TCE 410 1,2-DCE 1,412
MW153 7/14/95 VC 22 TCE 570 1,2-DCE 980
MW202 7/14/95 VC <10 TCE <5 1,2-DCE <5
MW133 9/11/95 VC <10 TCE 23 1,2-DCE 70
MW152 7/14/95 VC <10 TCE 150 1,2-DCE 5.3
MW135 7/14/95 VC <10 TCE <5 1,2-DCE <5
MW150 7/17/95 VC <10 TCE 65 1,2-DCE 6.7
MW200 7/17/95 VC <10 TCE <5 1,2-DCE <5
MW156 9/11/95 VC <10 TCE 280 1,2-DCE 30
MW146 7/14/95 VC <10 TCE 52 1,2-DCE <5
MW145 7/14/95 VC 12 TCE 5.6 1,2-DCE 530
MW10-1 7/14/95 VC <10 TCE 1,800 1,2-DCE 195.9
HP1 9/6/95 VC 500 TCE 430 1,2-DCE 3,912
MW151 7/14/95 VC <10 TCE <5 1,2-DCE 81.4
MW201 7/14/95 VC <10 TCE <5 1,2-DCE <5
SB10-1
SB10-2
SB10-3
SB10-4
SB10-5
SL10-1
SL10-2
OB1
OB2
SP1
FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 6/19/95
ACAD FILE: 0345GVOC
TCE, VC, AND 1,2-DCE IN GROUNDWATER
JULY 14-17 AND SEPTEMBER 11, 1995
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: KG
DETAILED: PJC
PROJECT NO.: 040020345
FIGURE: 8A

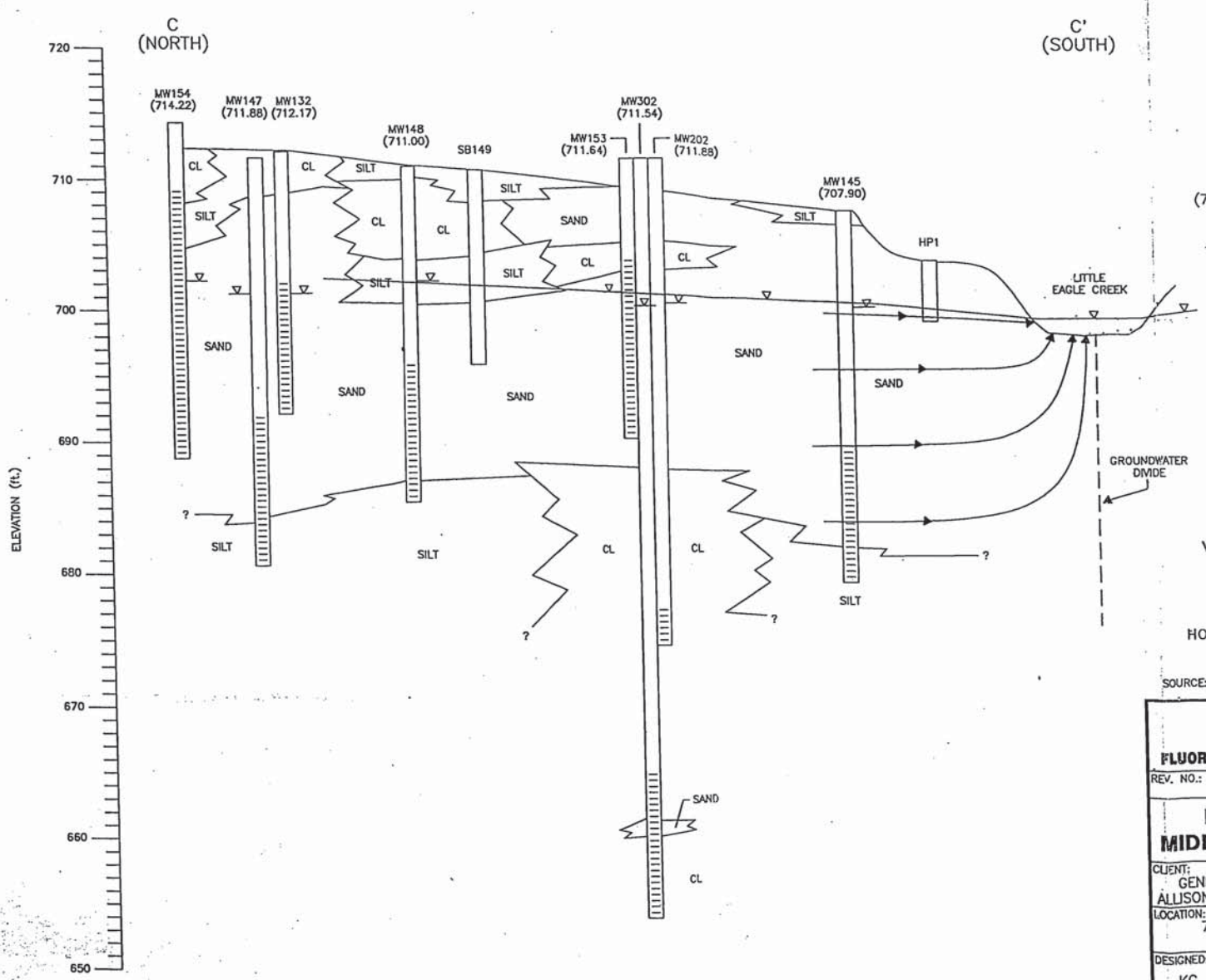

LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
NEW GEOPROBE POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
WELL IDENTIFICATION
SAMPLE DATE
VINYL CHLORIDE
TRICHLOROETHENE
1,2-DICHLOROETHENE
CONCENTRATIONS IN UG/L (PPB)
N
PLANT 10
HOLT ROAD
OLIN AVENUE
ALLEY
LITTLE EAGLE CREEK
STORAGE
ASPHALT
TREE LINE (TYPICAL)
FENCE
MW154 2/5/97 VC <10 TCE <5 1,2-DCE <5
MW147 2/5/97 VC <10 TCE 51 1,2-DCE 95
MW132 2/5/97 VC <250 TCE 15,000 1,2-DCE 65,000
MW158 2/6/97 VC <10 TCE <5 1,2-DCE <5
MW148 2/5/97 VC <10 TCE <5 1,2-DCE 73
MW155 2/6/97 VC 3,400 TCE <500 1,2-DCE 17,000
MW153 2/6/97 VC <10 TCE 5.4 1,2-DCE <5
MW133 2/5/97 VC <10 TCE 53 1,2-DCE 100
MW302 2/6/97 VC <10 TCE <5 1,2-DCE 8.2
MW202 2/6/97 VC <10 TCE <5 1,2-DCE <5
MW145 2/5/97 VC <10 TCE 43 1,2-DCE <5
MW146 2/6/97 VC <10 TCE 43 1,2-DCE <5
MW10-1 2/5/97 VC <10 TCE 810 1,2-DCE 120
MW301 2/6/97 VC <10 TCE <5 1,2-DCE <5
MW151 2/6/97 VC <10 TCE <5 1,2-DCE 20
MW201 2/6/97 VC <10 TCE <5 1,2-DCE <5
MW135 2/5/97 VC <10 TCE <5 1,2-DCE <5
MW150 2/5/97 VC <10 TCE 86 1,2-DCE <5
MW152 2/5/97 VC <10 TCE 150 1,2-DCE <5
MW200 2/5/97 VC <10 TCE <5 1,2-DCE <5
MW156 2/6/97 VC <10 TCE 52 1,2-DCE 7.5
MW157 2/6/97 2/26/97 VC <100 <10 TCE 60 100 1,2-DCE <50 <5
MW154 MW147 MW132 MW158 MW155 MW148 MW153 MW302 MW202 MW145 MW146 MW10-1 MW301 MW151 MW201 MW150 MW200 MW156 MW157 MW135 MW152 MW133 MW145 MW146 MW157
SB10-1 SB10-2 SB10-3 SB10-4 SB10-5 SB149 SB150 SB134 GP1 GP2 GP3 GP4 GP5 GP6 SP1 OB1 OB2 HP1
0 80 160
SCALE FEET
FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 3/4/97
ACAD FILE: 0262GVOC
VOC CONCENTRATIONS IN GROUNDWATER
FEBRUARY 5, 6, & 26, 1997
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: KG
DETAILED: PJC
PROJECT NO.: 040020262
FIGURE: 8B


LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
NEW GEOPROBE POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
OVERHEAD ELECTRICAL
(86) CONCENTRATION OF TRICHLOROETHENE IN GROUNDWATER (ug/L)
INTERPRETED CONCENTRATION CONTOUR
CONTOUR INTERVAL = x10 ug/L
PLANT 10
HOLT ROAD
OLIN AVENUE
ALLEY
LITTLE EAGLE CREEK
TREE LINE (TYPICAL)
FENCE
STORAGE
ASPHALT
MW154 (<5)
MW147 (51)
MW132 (15,000)
MW148 (<5)
MW158 (<5)
MW155 (<500)
SB149
GP1
GP2
GP3
GP4
GP5
GP6
MW302
MW153 (5.4)
MW202
MW133 (13)
SB150
MW145 (43)
HP1
ST-2
SB10-1
SB10-2
SB10-3
SB10-4
SB10-5
SB134
MW152 (150)
MW135 (<5)
MW150 (86)
MW200
OB1
OB2
SP1
MW10-1 (810)
MW146 (43)
MW156 (52)
MW157 (60)
MW301 (<5)
MW151 (<5)
MW201 (<5)
5,000
500
50
5
N
0 80 160
SCALE FEET
FLUOR DANIEL GTI
2/26/97
0262-SIT
TRICHLOROETHENE IN GROUNDWATER
February, 1997
GENERAL MOTORS CORPORATION
ALLISON ENGINE COMPANY PLANT #10
AG
700 NORTH OLIN AVENUE
INDIANAPOLIS, INDIANA
KG
PJC
010210262
9


LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
NEW GEOPROBE POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
OVERHEAD ELECTRICAL
(3,400) CONCENTRATION OF VINYL CHLORIDE IN GROUNDWATER (ug/L)
INTERPRETED CONCENTRATION CONTOUR
CONTOUR INTERVAL = x10 ug/L
PLANT 10
STORAGE
ASPHALT
OLIN AVENUE
HOLT ROAD
ALLEY
TREE LINE (TYPICAL)
FENCE
LITTLE EAGLE CREEK
MW154 (<10)
MW147 (<10)
MW132 (<250)
MW148 (<10)
MW155 (3,400)
MW158 (<10)
SB149
SB10-1
SB10-2
SB10-3
SB10-4
SB10-5
SB134
SB150
GP1
GP2
GP3
GP4
GP5
GP6
MW133 (<10)
MW153 (<10)
MW302
MW202
MW135 (<10)
MW150 (<10)
MW200
MW152 (<10)
OB1
OB2
SP1
MW10-1 (<10)
MW146 (<10)
MW145 (<10)
HP1
ST-2
MW156 (<10)
MW157 (<100)
MW301
MW151 (<10)
MW201
1,000
100
10
N
0 80 160
SCALE FEET
FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 2/26/97
ACAD FILE: 0262-SIT
VINYL CHLORIDE IN GROUNDWATER
February 1997
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: KG
DETAILED: PJC
PROJECT NO.: 010210262
FIGURE: 10


LEGEND
NEW SHALLOW 2" MONITORING WELL
NEW DEEP 2" MONITORING WELL
NEW AIR SPARGE/ VENT TEST WELL
NEW 2" OBSERVATION WELL
NEW HYDROPUNCH POINT
NEW GEOPROBE POINT
EXISTING SOIL BORING
EXISTING MONITORING WELL
OVERHEAD ELECTRICAL
(120) CONCENTRATION OF CIS,1,2-DICHLOROETHENE IN GROUNDWATER (ug/L)
INTERPRETED CONCENTRATION CONTOUR
CONTOUR INTERVAL = x10 ug/L
GROUNDWATER FLOW DIRECTION
PLANT 10
HOLT ROAD
OLIN AVENUE
ALLEY
LITTLE EAGLE CREEK
FENCE
TREE LINE (TYPICAL)
STORAGE
ASPHALT
MW154 (<5)
MW147 (95)
MW132 (65,000)
MW148 (73)
MW158 (<5)
MW155 (17,000)
SB149
SB10-1
SB10-2
SB10-3
GP1
GP2
GP3
GP4
GP5
GP6
MW133 (100)
MW302 8.2
MW153 (<5)
MW202 (<5)
SB150
MW145 (<5)
HP1
ST-2
SB134
SB10-5
SB10-4
MW152 (<5)
MW135 (<5)
MW150 (<5)
MW200
MW146 (<5)
OB1
OB2
SP1
MW10-1 (120)
MW156 (7.5)
MW157 (<50)
MW301
MW151 (20)
MW201
5,000
500
50
5
N
0 80 160
SCALE FEET
FLUOR DANIEL GTI
2/26/97
0262-SIT
CIS,1,2-DICHLOROETHENE IN GROUNDWATER
February, 1997
GENERAL MOTORS CORPORATION
ALLISON ENGINE COMPANY PLANT #10
AG
700 NORTH OLIN AVENUE
INDIANAPOLIS, INDIANA
KG
PJC
010210262
11


ALLISON PLANT PROPERTY
TREES
OLIN PARK
PLANT 10
NORTH OLIN AVENUE
RESIDENTIAL
RESIDENTIAL
ALLEY
WALNUT STREET
LUETT AVENUE
RESIDENTIAL
RESIDENTIAL
HOLT ROAD
TREES
TREES
TREES
LITTLE EAGLE CREEK
MICHIGAN MEADOWS APARTMENTS
ST-1
ST-2
ST-3
ST-1
10/96 2/97
TCE <5 <5
DCE <5 <5
VC <10 <10
ST-2
10/96 2/97
TCE <5 <5
DCE 17 <5
VC <10 <10
ST-3
10/96 2/97
TCE <5 <5
DCE 14 <5
VC <10 <10
LEGEND
STREAM SAMPLE LOCATION
ST-1
10/96 2/97
TCE <5 <5
DCE <5 <5
VC <10 <10
SAMPLE POINT
SAMPLE DATE
TRICHLOROETHENE
(CIS)1,2-DICHLOROETHENE
VINYL CHLORIDE
CONCENTRATIONS IN UG/L (PPB)
N
0 120 240
SCALE FEET
SOURCE: AERIAL PHOTO
FLUOR DANIEL GTI
6330 E. 75TH ST., STE 176
INDIANAPOLIS, IN 46250
(317) 595-6400
REV. NO.:
DRAWING DATE: 10/18/96
ACAD FILE: STREAM
VOC CONCENTRATIONS IN CREEK
OCTOBER 4, 1996 & FEBRUARY 10, 1997
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10
PM: AG
LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA
PE/RG:
DESIGNED: AG
DETAILED: PJC
PROJECT NO.: 040020345
FIGURE: 12



LEGEND

WELL CASING

WELL SCREEN

STATIC WATER LEVEL (FEBRUARY 1997)

(714.22) SURVEYED ELEVATION TOP OF CASING

GROUNDWATER FLOW DIRECTION

VERTICAL SCALE AS SHOWN

0 60 120

HORIZONTAL SCALE FEET

SOURCE: GEOLOGIST SKETCH

FLUOR DANIEL GTI

6330 EAST 75TH STREET
SUITE 174
INDIANAPOLIS, IN 46250
(317) 595-6400

REV. NO.:	DRAWING DATE: 3/4/97	ACAD FILE: 0262-XCC

FLOW DIRECTION IN MIDDLE CONFINED AQUIFER

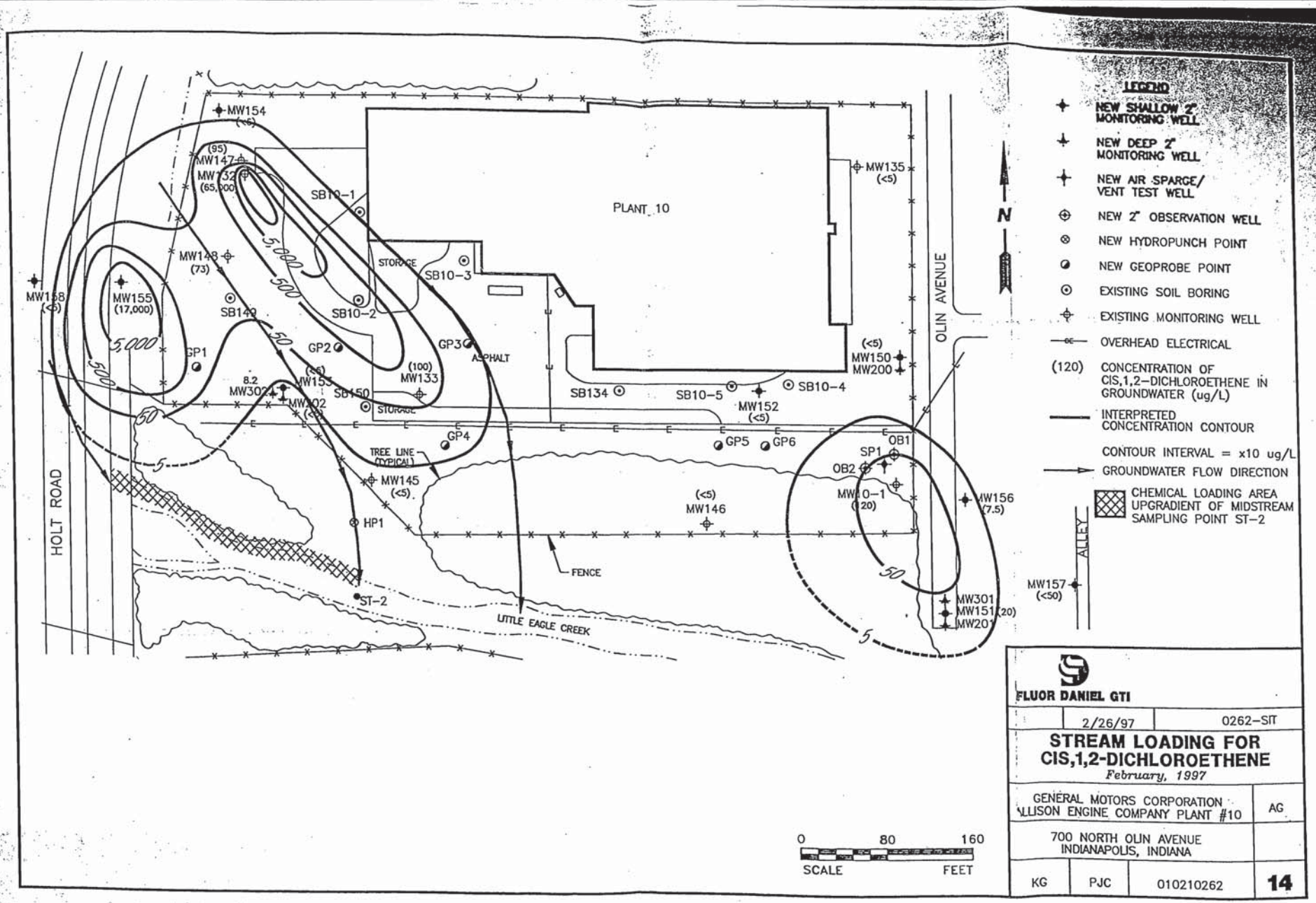
CLIENT: GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10

PM:

LOCATION: 700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA

PE/RG:

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
KG	PJC	010210262	13



FLUOR DANIEL GTI

	2/26/97	0262-SIT

STREAM LOADING FOR CIS,1,2-DICHLOROETHENE

February, 1997

GENERAL MOTORS CORPORATION ALLISON ENGINE COMPANY PLANT #10	AG
700 NORTH OLIN AVENUE INDIANAPOLIS, INDIANA	

KG	PJC	010210262	14