100444

DRAFT

FEASIBILITY STUDY ADDENDUM

STANDARD CHLORINE OF DELAWARE, INC.
DELAWARE CITY, DELAWARE FACILITY

September 1993

Prepared by:

Roy F. Weston, Inc.
One Weston Way
West Chester, PA 19380

W.O. #02267-012-001

AR308120

TABLE OF CONTENTS

Section	Title	Page
	EXECUTIVE SUMMARY	ES-1
1	INTRODUCTION	1-1
	1.1 Purpose and Organization of the Report	1-1
2	REVIEW OF TREATABILITY STUDY RESULTS	2-1
	2.1 Overview of Findings	2-1
	2.2 Overview of Conclusions	2-1
3	APPLICABILITY OF BIOLOGICAL TREATMENT TO THE SITE	3-1
	3.1 Alternative 5, Option A	3-1
	3.1.1 Process Description	3-1
	3.1.2 Effectiveness	3-2
	3.1.3 Cost	3-4
	3.2 Alternative 5, Option B	3-4
	3.2.1 Process Description	3-4
	3.2.2 Effectiveness	3-6
	3.2.3 Cost	3-7
	3.3 Other Alternatives	3-8
4	COMPARISON OF ALTERNATIVES	4-1
	4.1 Alternative 3 - Closure	4-1
	4.2 Alternative 4, Option A - Thermal Treatment	4-1
	4.3 Alternative 5, Option A - Ex Situ Biological Treatment	4-2
	4.4 Alternative 5, Option B - In Situ Biological Treatment	4-2
APPENDIX A	BIOREMEDIATION TREATABILITY TESTING PROGRAM SUMMARY OF FINDINGS	

LIST OF TABLES

Table	Title	Page
3-1	Summary of Treatability Study Flask Test Results	3-3

EXECUTIVE SUMMARY

This Executive Summary has been updated from the Executive Summary presented in the Final Feasibility Study (FS), submitted in May 1993, to reflect information obtained from the biological treatability study, completed in September 1993. Specifically, Alternative 5 - Biological Treatment has been modified based on the new information, and a biological treatment component is presented for Alternative 3 - Closure, and Alternative 4 - Thermal Treatment. This addendum is not intended to replace the detailed analysis presented in the FS, rather it is intended to supplement the information presented in the FS based on the current understanding of the feasibility of biological treatment at the site.

Standard Chlorine of Delaware, Inc. (SCD) is located approximately three miles northeast of Delaware City, Delaware and is bounded to the north and east by property owned by Occidental Chemical Company (formerly Diamond Shamrock Company), to the west by the Air Products Company and to the south by property owned by Star Enterprises, Inc. and Delmarva Power and Light. The SCD facility was constructed in 1965 on farmland purchased from the Diamond Alkali Company which had purchased the land from Tidewater Refinery Company.

SCD plant operations were started in 1966 with the production of chlorinated benzene including chlorobenzene, paradichlorobenzene, orthodichlorobenzene, and lesser amounts of metadichlorobenzene and trichlorobenzene. Although operational production has varied over the years, these chemicals are still the primary products produced at the plant.

As a result of a 1981 release of chlorinated benzene product, the SCD site was evaluated by the U.S. Environmental Protection Agency (EPA), and the Delaware Department of Natural Resources and Environmental Control (DNREC), and based on the results of this evaluation, was placed on the National Priorities List (NPL) in 1985. SCD is required to complete a RI/FS meeting the requirements of the revised National Contingency Plan (NCP) and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

As specified in the Consent Order and Agreement executed on 12 January 1988 (amended 14 November 1988) between the Delaware Department of Natural Resources and Environmental Control (DNREC) and SCD, the FS for the SCD Delaware City, Delaware facility has been performed to develop, screen, and evaluate alternative remedial actions for the site. Alternatives are evaluated in terms of criteria specified under the revised National Contingency Plan (NCP) and current United States Environmental Protection Agency (EPA) Superfund guidance documents.

The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste (40 CFR 300.430). The overall approach followed by this FS consists of the six major steps:

1. Project Scoping - Involves site characterization, development of remedial action objectives, and identification of general response actions.

2. Identification of Applicable or Relevant and Appropriate Environmental and Public Health Requirements (ARARs) - Involves identification of cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal, state, or local law that are either potentially applicable or relevant and appropriate to address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at the site.

3. Identification and Screening of Technologies - The spectrum of available technologies were identified and screened based on effectiveness, implementability and relative cost.

4. Development and Screening of Alternatives - Those technologies that were retained are assembled into comprehensive alternatives that address the site as a whole. These alternative were screened based on effectiveness, implementability, and cost. Retained alternatives were carried into the detailed analysis.

5. Detailed Analysis of Alternatives - Based on criteria specified in the revised NCP and current EPA Superfund guidance.

6. Comparison of alternatives and recommendations.

Project Scoping

The development and evaluation of remedial alternatives is based on the site characterization. Site Characterization involves definition of a site conditions based on the site background, results from the Remedial Investigation (RI) which includes the Baseline Risk Assessment. The RI was submitted as a final document in September 1992.

Summary of Site Conditions

The following paragraphs present the areas of concern as identified by the RI, and discusses the issues concerning these areas.

Information gathered and evaluated during the RI indicates that site-specific chemicals (chlorobenzenes) are present in surficial soils located in the on-site railroad track area. The ballast in the railroad track area reduces the ability of the contaminant to migrate via surface runoff. Additional protection against surface contaminant runoff is provided by the sediment control barriers which were installed in this area and other site drainageways as part of the interim site remedial measures completed by Standard Chlorine.

As indicated by the Baseline Risk Assessment, dermal contact with soils accounts for the majority of potential risks associated with possible exposure to site-related chemicals. Direct contact with soils in the railroad area is limited due to the presence of the railroad ballast. Additionally, human traffic in this area of the site is normally avoided because of the general unsuitable condition, for walking or work activity. Similarly, contact to surface soil contamination present in the on-site eastern drainage ditch will be limited and incidental since this specific area is not normally traversed by workers or visitors.

Subsurface contamination, while present at significant levels in the immediate area of the 1981 release and in the vicinity of the catch basin No. 1 soil, is not being contacted by any receptors. However, subsurface soil contamination in these areas, and other locations at this site, represent a possible continual source of groundwater contamination.

The RI analytical data indicates the soil and sediment quality conditions in some off-site areas, particularly the northwest drainage gully and the unnamed tributary area, have been affected by the 1986 release. The levels of site-related chemicals in sediments of the unnamed tributary area are extremely variable, with the higher concentrations, generally found in the area between the soil dike and the silt fence, a sediment barrier installed subsequent to the 1986 release and maintained at the mouth of the unnamed tributary. Sediment analytical data indicates that this silt fence has limited the migration of contaminants into the Red Lion Creek area and was effective at containing the majority of the spill to the unnamed tributary area.

Potential ecological risks posed by the site-specific chemicals in the northwest gully and the unnamed tributary are expected to be variable due to the nonuniformity of contaminant distribution.

Potential human exposure to site-related chemicals in the unnamed tributary and the northwest drainage gully are expected to be limited since these areas are located on industrially-owned properties which have fences or natural barriers to access. Furthermore, these areas represent unlikely areas of human encounter due to the unstable footing conditions (i.e., steeply sloped and wetlands) that exist at these locations.

The risk of exposure to contaminants in the soil piles and sedimentation basin is not expected to be significant. Previous remedial measures completed by SCD have reduced the potential for direct or indirect exposure to the soil piles. These piles have recently been reconsolidated, from three to two piles, and outfitted with a new cover. This reduces the potential for direct exposure to these materials, and further reduces the ability of the contaminants to migrate due to runoff from these piles. Exposure to the volatilization of contaminants in the soil piles has also been reduced, but not eliminated, by the installation of the soil pile covers.

Exposure to soil contaminants in the off-site effluent area is expected to be minimal, since significant levels of the SCD contaminants were found to be both isolated in occurrence and

deep in the soil profile. These contaminated subsurface soils, however, are a source of localized groundwater contamination in this area of the site.

Site-specific chemicals are present in groundwater of the Columbia Formation beneath the SCD site, and the off-site property directly north of the SCD facility. Groundwater samples obtained from Upper Potomac aquifer wells located immediately outside of the boundaries show no detectable levels of site-specific chemicals. The site-specific chemicals in groundwater of the Columbia Formation have migrated to groundwater discharge points along the unnamed tributary and Red Lion Creek. RI data indicates that surface water quality impacts in the unnamed tributary and Red Lion Creek have resulted from the discharge of contaminated groundwater to these surface water bodies. While site contaminants exist in the Columbia Formation, the ingestion of groundwater as a potential future exposure pathway is considered unlikely since potable water is currently supplied to the site and a reliable source of potable groundwater is available off-site.

Development of Alternatives

The technologies that were retained following the identification and screening of technologies were assembled into site-wide alternatives. The assembled alternative were again screened for implementability, effectiveness, and cost. The following summarizes remedial alternatives which have been evaluated:

- Alternative 1 - No Action: Provides the baseline for comparing existing site conditions with those resulting from implementation of other proposed alternatives. Under the no action alternative, no additional remedial action would be performed. Current remedial activities, such as groundwater extraction and treatment, and maintenance of the sedimentation basin and soil piles, would cease.

- Alternative 2 - Containment: Involves implementation of institutional and physical controls aimed at limiting site access to reduce potential future exposure of human receptors. Physical barriers, such as security fences and silt fences, would be installed to limit contaminant migration and direct contact. An enhanced groundwater extraction and treatment, using additional extraction wells and low volume product recovery wells, would be

implemented. Readily accessible, highly contaminated surface soils would be removed and stabilized, in situ, with the sediments currently in the basin. Subsurface soils along the western drainage ditch, and the catch basin would also be removed and stabilized. The basin would then be capped and closed. Excavations, and the railroad track area, would be capped.

- Alternative 3 - Closure: Involves installation of an enhanced groundwater interception system to collect groundwater exiting the site. Low volume product recovery wells would also be installed. Removal of readily accessible, highly contaminated surface soils and sediments would be performed. Subsurface soils along the western drainage ditch, and the catch basin would also be removed. If implemented, in situ biological treatment would be used to remediate those sediments exceeding response levels in lieu of sediment removal. Any removed materials would undergo ex situ stabilization/ solidification prior to consolidation in a reconstructed lined unit. The sedimentation basin would be reconstructed with a new liner, leachate collection system, and cap prior to final closure. Excavations, and the railroad track area, would be capped. Implementation of the institutional controls as described under Alternative 2 would also be performed.

- Alternative 4 - Thermal Treatment: Involves installation of an enhanced groundwater interception system to collect groundwater exiting the site. Low volume recovery wells for product extraction would be installed. Removal of readily accessible, highly contaminated surface soils and sediments would be performed. Subsurface soils along the western drainage ditch, and the catch basin would also be removed. The removed materials would undergo thermal desorption prior to backfill, or consolidation into the retrofitted (see Alternative 3) sedimentation basin. Excavations, and the railroad track area, would be capped. As an option, all sediments above response levels would be removed and thermally treated, or treated in situ using biological treatment. Short term negative impacts would occur from excavation and removal activities in the wetland areas, while the short term impacts are expected to be less severe if in situ biological treatment is performed.

- Alternative 5 - Biological Treatment: Involves installation of an enhanced groundwater extraction system to capture groundwater exiting the site. Recovery wells for product extraction would be installed. Ex situ biological treatment would be performed on all surface soils and sediments above the response levels. In situ treatment would be performed on the sediments above the response as an option to augment other alternatives.

Evaluation of Alternatives

In accordance with the NCP and EPA Superfund guidance documents, the following seven criteria were used for evaluation of each of the site alternatives that were selected for detailed analysis and represent the basis for comparing these alternatives:

- Compliance with ARARs.
- Overall Protection of Human Health and the Environment.
- Short-Term Effectiveness.
- Long-Term Effectiveness and Permanence.
- Reduction of Toxicity, Mobility, and Volume of contaminants.
- Implementability.
- Estimated Order of Magnitude (+50% to -30% accuracy) Cost.

Highlights from the detailed/comparative analysis included the following:

- Alternative 1 - No Action: Noted as having major limitations associated with: compliance with ARARs, long-term effectiveness, reduction of toxicity, mobility, or volume, and overall protection of human health and the environment. There are no costs incurred under this alternative.

- Alternative 2 - Containment: Meets or exceeds short-term effectiveness, implementability, and cost criteria. A limitation of this alternative is the lack of sediment removal. ARARs may only be met in the long term. The estimated present worth costs for this alternative is $3.5M.

- Alternative 3 - Closure: Meets all non-cost criteria, including overall protection of human health and the environment, and complies with ARARs. Alternative 3 addresses those media posing the greatest potential for future exposure to site contaminants, while providing several measures, including stabilization, a groundwater interception barrier, and a new liner and leachate collection system for the basin to prevent migration of contaminants. Implementation of in situ biological treatment in the wetlands would enhance the protectiveness, and effectiveness of this alternative. The estimated present worth costs for this alternative is $6.7M.

- Alternative 4 - Thermal Treatment: Represents a higher cost alternative but removes the contaminants from the soils/sediment of concern and intercepts groundwater migration. Implementation of in situ biological treatment in the wetlands as part of this alternative may lower the cost, and lessen the short-term impacts to the wetlands. The estimated present worth costs for this alternative ranged from $11.7M to $17.6M.

- Alternative 5 - Biological Treatment: May meet all non-cost criteria if performed ex situ. In situ application of the technology may be effective in the wetlands. Implementability, and effectiveness would require further evaluation during remedial design, but initial results from the treatability study are promising. When optimized, this alternative removes contaminants and may represent a cost effective alternative for handling contaminated soils/sediments as a stand alone alternative or as a component within one of the other alternatives.

Recommended Alternative

The remedial action alternative selected for this site must address certain statutory requirements of the Superfund Amendments and Reauthorization Act (SARA) of 1986 as follows:

1. Protect human health and the environment.
2. Comply with ARARs.
3. Utilize permanent solutions and alternate treatment technologies to the extent possible.

Based on these statutory requirements, and the information presented in the detailed analysis of alternatives, Alternative 3 (Closure) is recommended for selection as the remedial action alternative. This alternative should be implemented in a phased manner to be most effective and address the primary contaminants' pathways first. This recommendation is supported by the following:

1. Overall Protectiveness of Human Health and the Environment

   - Under this alternative, a groundwater extraction system, including an interceptor trench and low volume product recovery wells, is installed to capture groundwater that currently exits the site into the Unnamed Tributary and Red Lion Creek. This will control contaminant migration into these sensitive receptors, and allow natural attenuation processes to degrade the contaminants in the wetlands.

DRAFT

- Accessible surface soils, subsurface soils, and sediments containing the highest concentrations of contaminants are removed, treated, and consolidated into the reconstructed sedimentation basin. Those surface soils exceeding response levels that are not removed, are contained by the use of surface caps. This reduces potential future exposure to those materials.

- All the sediments exceeding the response levels may be treated by implementing in situ biological treatment. This would enhance the alternative in all evaluation criteria categories. It is recognized that further evaluation of in situ treatment would be required during the remedial design phase.

- Short-term negative impacts to the surrounding environment are minimized. Extensive dredging actions, required for other alternatives, could have negative impacts on the wetland areas. Implementation of in situ bioremediation would further lessen these impacts.

- Stabilization and containment of the removed materials, and installation and operation of the enhanced groundwater extraction and treatment system provide permanent remediation for affected media.

2. Comply with ARARs

- Alternative 3 complies with all identified ARARs. Specifically, 1) surface water quality criteria are addressed through installation of the interceptor trench, 2) land disposal restrictions are addressed by treatment (stabilization) of removed materials prior to containment in the basin, 3) and the minimum technology requirement for construction of a landfill (in this case the basin) will be met by reconstructing the basin with a new liner, leachate collection system, and final cover.

3. Utilize Permanent Solutions and Alternative Treatment Technologies to the Extent Practical

- This alternative provides a permanent solution by stabilizing the contaminated soils/sediments and containing them in a lined and capped unit meeting RCRA minimum technology standards. Optionally, sediments would be treated permanently in place via bioremediation.

- Treatment technologies are employed for the recovered groundwater using the plant's wastewater treatment system.

SECTION 1

INTRODUCTION

This Feasibility Study Addendum (FSA) presents additional information to the Feasibility Study (FS) as a result of the biological treatability study conducted as part of the FS at the Standard Chlorine of Delaware, Inc. (SCD) Delaware City, Delaware facility. The Final FS Report has been submitted to the EPA and the DNREC in April, 1993. During preparation of the FS, it was apparent that biological treatment may offer distinct advantages over other treatment technologies. A literature review conducted in response to this determination indicated that biological degradation or transformation of certain chlorinated benzenes may be achievable under certain conditions. However, field-scale application of this process is limited. To support the evaluation of bioremediation for soils and sediments at the SCD facility, additional information concerning the ability of microorganisms to degrade the chlorinated benzenes at the site was required. A biological treatability study was performed to gather this additional information.

1.1 PURPOSE AND ORGANIZATION OF THE REPORT

This FSA has been prepared to interpret the information obtained during the treatability study, and revisit the biological remedial alternative presented in the FS based on this new information. This report is not intended to replace the detailed analysis presented in the FS, rather it is intended to supplement the information presented in the FS based on the current understanding of the feasibility of biological treatment at the site.

A summary of the important findings and conclusions of the treatability study are presented in Section 2 of this FSA. In Section 3, the biological treatment alternative is revisited; including discussions on implementation and effectiveness of biological treatment. A comparison of alternatives is presented in Section 4.

AR308131

SECTION 2

REVIEW OF TREATABILITY STUDY RESULTS

The complete summary of the findings of the treatability study are included in Appendix A. An overview of the major findings and conclusions are summarized below.

2.1 OVERVIEW OF FINDINGS

- All aerobic samples (including control samples) showed a net reduction in total chlorinated benzenes, typically by 50 percent or more during the test duration. A net increase in total chlorides relative to the control samples was observed in one test case (subsurface soil sample), but not observed in the others (surface soil, and sediment samples).

- A decrease in total chlorinated benzenes, and an increase in total chlorides relative to the control samples was observed in the anaerobic surface soil sample. This trend was not observed in the subsurface soil, or the sediment sample.

2.2 OVERVIEW OF CONCLUSIONS

- Presumptive evidence of biological transformation of chlorinated benzenes was exhibited in the anaerobic surface soil, and aerobic subsurface soil samples.

- The aerobic surface soil and aerobic subsurface soil samples exhibited a high initial rate of total chlorinated benzene losses. These losses are likely attributed to stripping from the test slurry phase since a concurrent increase in total chlorides was not observed.

- Additional process development testing would be necessary to expand the application of biodegradation to a wider range of soils and conditions; specifically towards application in the wetland areas. Nutrient addition in these areas may promote natural degradation of contaminants, as seen in the anaerobic surface soil and aerobic subsurface soil tests.

The impact of these findings and conclusions is discussed in Section 3.

SECTION 3

APPLICABILITY OF BIOLOGICAL TREATMENT TO THE SITE

In this section the applicability of biological treatment, in the context of the new information gathered from the treatability study, is discussed. Attention is focused on application of biological treatment to those portions of the site potentially requiring treatment, as identified in the FS. Other issues relating to the application of biological treatment are also discussed.

The FS has presented two approaches to biological treatment: ex situ treatment and in situ treatment (Options A and B respectively). During the detailed analysis of biological treatment, it was noted in the discussions of several evaluation criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contaminants; implementability; and cost) that additional information would be provided upon completion of the treatability study. This new information is discussed for each option of Alternative 5 in the subsections that follow. In addition, the results of the treatability study suggest that biological treatment may be used to augment other alternatives presented in the FS. A discussion of the implementation of biological treatment, as part of the other alternatives, is also provided.

3.1 ALTERNATIVE 5, OPTION A

3.1.1 Process Description

The key components of Alternative 5, Option A, as described in the FS are as follows:

- Removal - Removal of accessible surface soils and sediments above response levels. The materials designated for removal are identical to those identified in the FS for Alternative 4, Option B.
- Ex Situ Biological Treatment - Treatment of the surface soils and sediments using ex situ biological treatment. Recovered aqueous phase liquids will be conveyed to the groundwater treatment system for treatment. Treated soils and sediments would be used for backfill of the excavations, and those treated materials not used as backfill would be consolidated into the sedimentation basin.

AR308133

- Basin Reconstruction (if needed) - Installation of a new liner and leachate collection system in the sedimentation basin. If treated soils/sediments do not meet acceptable residual concentrations, a multilayer cap would be placed over the materials upon completion of treatment activities.

- Stabilization/Solidification - Addition of a stabilization/solidification agent, if required, to the treated materials. This would be performed, if required, prior to backfilling the treated materials into the excavations, or sedimentation basin. Stabilization/solidification would be required if the treated materials (soils and sediments) do not meet LDRs. Those materials being used as clean backfill for the excavation would need to meet acceptable residual concentrations.

- Enhanced Groundwater Interception and Treatment – This is the same program as described in the FS for Alternative 4.

As discussed in the FS, implementation of ex situ biological treatment would be similar to implementation of thermal desorption as discussed in the FS, with a bioreactor or controlled treatment unit being substituted for the thermal desorber. The treatability study provided some additional information into the implementation of an ex situ, slurry phase treatment system. If the laboratory tests are to be scaled-up for site remediation, the treatment system may consist of a slurry-phase bioreactor equipped with emission controls (if stripping is determined to be a significant treatment mechanism). Treatment of bioremediation off-gases with the off-gas from the groundwater treatment system is expected to be a viable method.

3.1.2 Effectiveness

The flask tests performed during the treatability study can be considered representative of ex situ slurry-phase biological treatment, as the treatment process performed in the laboratory can be duplicated on a larger scale. Therefore, the results of the treatability study can be considered indicative of the effectiveness of treatment one would expect during full-scale remediation.

The data from the treatability study showed significant reductions in total chlorinated benzenes in many cases. The reductions in chlorinated benzenes are presented on Table 3-1. The

WESTON

Table 3-1

Summary of Treatability Study Flask Test Results
Standard Chlorine of Delaware, Inc.

Sample Matrix	Test Method		Total Chlorinated Benzenes		
			Average Initial Concentration (mg/kg)	Average Final Concentration (mg/kg)	Average % Removed
Surface Soil Flasks	Aerobic	C	3,807	70.4	98.15
		N	2,395	59.3	97.52
		NI	1,422	75.0	94.73
	Anaerobic	C	2,577	1,817	29.49
		N	3,291	1,494	54.60
		NI	2,586	1,499	42.03
Subsurface Soil Flasks	Aerobic	C	197	142	27.92
		N	488	232	52.46
		NI	414	70.0	83.09
	Anaerobic	C	457	808	-76.81
		N	371	1,227	-230.73
		NI	307	532	-73.29
Sediment Flasks	Aerobic	C	412	43.7	89.39
		N	283	53.7	81.02
		NI	436	40.8	90.64
	Anaerobic	C	129	240	-86.05
		N	301	349	-15.95
		NI	255	298	-16.86

NOTES:

C - Control flask.
N - Nutrient flask.
NI - Nutrient/inoculated flask.

AR308135

mechanism of treatment was not clearly indicative of biological treatment in many cases, but chlorinated benzene concentrations decreased nonetheless. Stripping has been forwarded as one possible treatment mechanism that may account for the chlorinated benzene reductions. In the event that stripping is determined to be a significant mechanism of treatment, proper emission treatment measures would be implemented to control emissions.

The results of the treatability study showed significant reductions in the concentration of total chlorinated benzenes of the test soils in many cases. This results in a reduction of the toxicity of the soils. The volume of materials requiring treatment would increase initially if slurry-phase treatment is employed; the water added to the soils would require treatment prior to discharge. This short-term increase is offset in the long-term by an overall reduction in the volume of contaminated materials. The mobility of the contaminants would decrease, as contaminated media are removed, and treated.

Further testing of biological treatment, and determination of the other potential treatment mechanisms, is required to identify the ultimate effectiveness that can be achieved by biodegradation, although the results of the treatability study are promising.

DRAFT

3.1.3 Cost

Information provided by the treatability study suggests that emission controls may require consideration, thus incurring some additional incremental costs. However, the cost ranges provided in the FS, are still expected to be valid.

3.2 ALTERNATIVE 5, OPTION B

3.2.1 Process Description

The key components of Alternative 5, Option B, as described in the FS, are as follows:

- In Situ Biological Treatment - Treatment of all materials exceeding response

AR308136

levels would be performed using in situ biological treatment. This would include: surface soils, sediments, soil piles, and sediments in the sedimentation basin. Subsurface soils underlying surface soils above the response levels would also be treated.

- Enhanced Groundwater Interception and Treatment - This is the same program as described in the FS for Alternative 4.

Implementation of in situ biological treatment in the wetland areas is chosen for consideration for several reasons. First, in situ transformation may allow for treatment of affected sediments while minimizing disruption of these sensitive areas. In situ implementation, by definition, does not require the removal of the contaminated materials for treatment. Second, the implementation of biological treatment in these areas could be carried out in a timely manner. In the anaerobic surface soil sample, the treatability test results showed significant chlorinated benzene reductions during the short duration of the study. Further development of a biological treatment technology may have the potential for achieving similar results in sediments. Third, in situ biological treatment may offer a cost-effective solution to the contamination in these areas.

Remediation of other areas, such as: surface soils, subsurface soils, soil piles, and the sedimentation basin, are no longer included as part of Alternative 5, Option B at this time. The reasons for removing these media from consideration for in situ biological treatment are discussed in the effectiveness discussion. Although Alternative 5, Option B is no longer a complete, site-wide alternative, it should be considered as a supplement to other alternatives (Alternative 3, Alternative 4, Option A) that offered a limited wetlands treatment strategy.

Based on information gathered during the treatability study, the key components of Alternative 5, Option B would be as follows:

Wetlands

- Hot Spot Removal - Hot spots, containing high concentrations of chlorinated benzenes, would be removed using excavation and dredging techniques if these

concentrations are determined to be toxic to the degrading organisms. The determination of the threshold concentration of chlorinated benzenes would be determined as part of remedial design. As stated, these hot spots would be removed if it is determined that they exhibit inhibitive toxicity to the chlorinated benzene-degrading organisms.

- Amendment Addition - Amendments, including nitrogen, phosphorous, and/or microorganisms (indigenous and/or acclimated) would be added to the contaminated areas in the wetlands to promote enhanced biodegradation. Common lawn fertilizer may be a possible source of the nitrogen and phosphorous. To minimize suspension of sediments, the amendments may be added to the water surface, and allowed to dissolve and sink into the sediments via natural mechanisms. Addition of oxygen to promote aerobic degradation is not being considered since the treatability data suggest that anaerobic transformation may be effective.

- Containment - To attempt containment of the enhanced biodegradation operation to the unnamed tributary, an additional silt fence would be installed on the upstream (south) side of the existing silt fence. This would set up a monitoring zone between the two silt fences.

- Monitoring - The progress of biodegradation would be monitored by collecting periodic samples (at six month to one year intervals) of sediments and surface water from within the unnamed tributary.

3.2.2 Effectiveness

The results of the biological treatability study did indicate evidence of biological transformation when testing the surface soil under anaerobic conditions, and the subsurface soil under aerobic conditions. Although convincing evidence of biotransformation was not noted for sediment samples, this lack of evidence in the laboratory study does not necessarily preclude biological treatment of these media. Many other variables, such as the initial concentration of contaminants, the initial population of indigenous microorganisms, and other test variations, may account for the test results. If these results can be duplicated in sediments, biological treatment may offer a permanent means of treatment of these areas without the adverse impacts caused by dredging and excavation. Further understanding of the mechanisms of biological treatment of

AR308138

chlorinated benzenes may allow for effective, permanent, in situ treatment of the sediments.

Prior to implementation, the effects of amendment addition to the wetlands requires investigation. Additions of nutrients, such as nitrogen and phosphorous, would change the chemical balance of the existing wetlands. Introduction of additional microorganisms would also require similar investigation.

The column tests performed as part of the treatability study indicate that a significant quantity of chlorinated benzenes leached out of the soils during testing. From this, one would expect significant mobilization of contaminants to groundwater if in situ biodegradation were implemented for the treatment of surface and subsurface soils. This represents a permanent treatment of soils, however, the contaminants mobilized into groundwater may either be removed by the proposed groundwater recovery system, or may pool into a dense non-aqueous phase liquid (DNAPL) at the top of the Potomac Formation. In situ bioremediation of surface soils, subsurface soils, and the soil piles is therefore not being considered under this alternative at this time. It is acknowledged, however, that additional information gathered from future bioremediation studies may make in situ bioremediation of these media feasible.

In situ biodegradation of the contaminants in the wetland sediments would result in a reduction of the toxicity of these sediments. The volume of contaminated sediments would also be reduced. The mobility of the contaminants would be expected to be unchanged, provided that the method of amendment addition is non-intrusive.

3.2.3 Cost

The information gathered from the treatability study does not provide information to modify the unit costs presented as part of the FS. However, it should be noted that the simple addition of lawn fertilizer to the affected areas would be inexpensive, and would fall an order of magnitude or more below the low range of unit costs for bioremediation presented (expected cost of

$50,000 or less for fertilizer addition).

3.3 OTHER ALTERNATIVES

Other alternatives presented in the FS, specifically Alternative 3 (closure) and Alternative 4, Option A (thermal treatment), proposed limited source removal in the wetlands. Implementation of in situ bioremediation in the wetlands offers a way to remediate these areas while avoiding the drawbacks of excavation and dredging.

If implemented under Alternative 3 or Alternative 4, Option A, in situ bioremediation would proceed as described above under Alternative 5, Option B. The limited sediment removal strategies proposed for these alternatives would be modified to include only hot spot removals, if necessary. The monitoring programs of the alternatives could also be adjusted to account for the bioremediation of the wetlands.

DR

AR308140

SECTION 4

COMPARISON OF ALTERNATIVES

In this section the alternatives presented in the FS are compared to the alternatives presented in Section 3 to point out the major differences. Where changes have been made, or enhancements have been suggested, the effect of the changes to the detailed analysis evaluation criteria is discussed. Alternatives 1 and 2 are not included in this discussion, as no changes were made or proposed to these alternatives.

4.1 ALTERNATIVE 3 - CLOSURE

The implementation of in situ biological treatment in the wetlands would increase the overall effectiveness and protectiveness of the alternative. Previously, limited removal and treatment (consisting of removal of readily accessible, highly contaminated sediments along the shoreline) of contaminated sediment was proposed. The introduction of in situ biological treatment to this alternative provides for a more aggressive approach to remediation in these areas.

If in situ bioremediation is implemented in the wetlands, the short-term as well as long-term impact to the wetlands will require evaluation as part of remedial design. While bioremediation may result in a permanent reduction in chlorinated benzenes in the wetlands, introduction of nutrients, and potentially microorganisms may change the short-term chemical and biological makeup of the area. It should be noted that dredging and excavation as originally proposed in the FS may have a more severe effect on the area.

4.2 ALTERNATIVE 4, OPTION A - THERMAL TREATMENT

The issues discussed above, for Alternative 3, would also apply to Alternative 4, Option A. Use of in situ biological treatment under this alternative would make this alternative more closely resemble Alternative 4, Option B in its overall protectiveness.

AR308141

4.3 ALTERNATIVE 5, OPTION A - EX SITU BIOLOGICAL TREATMENT

No significant changes were made to this alternative. More information is presented concerning the implementation, and expected effectiveness of the alternative based on the results of the treatability study. The treatability study suggests that ex situ biological treatment can be carried in the slurry-phase under certain conditions. More investigation is necessary to determine the process (aerobic or anaerobic) that would result in the most effective treatment. Also, more investigation is necessary to verify that treatment can be performed on the sediments of the site.

4.4 ALTERNATIVE 5, OPTION B - IN SITU BIOLOGICAL TREATMENT

This alternative has been modified to reflect the information gathered from the treatability study. Several media, including surface soils and subsurface soils, have been eliminated from consideration of in situ treatment based on the results of column testing performed in the laboratory. Laboratory column testing showed a tendency for contaminants to mobilize when the subsurface soil was saturated, thus generating leachate that would be expected to enter groundwater if performed at the site. Although this would perform treatment of the soils, the leachate would have a detrimental effect on groundwater quality.

Alternative 5, Option B still addresses in situ bioremediation of sediments in the wetlands. This remedial option may have several advantages over ex situ treatment. Further investigation is require to determine the short- and long-term impacts to the wetlands, and to further maximize biological activity in sediments. Inclusion of this remedial option as part of other alternatives has been presented.

DRAFT

AR308142

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

APPENDIX A

BIOREMEDIATION TREATABILITY TESTING PROGRAM SUMMARY OF FINDINGS

WESTON

BIOREMEDIATION TREATABILITY TESTING PROGRAM
SUMMARY OF FINDINGS

DRAFT

Standard Chlorine of Delaware, Inc.
Delaware City, Delaware

September 1993

Prepared by

Roy F. Weston, Inc.
1 Weston Way
West Chester, Pennsylvania 19380-1499

WESTON

TABLE OF CONTENTS

Section	Title	Page
1.0	Overview	1
2.0	Test Plans	2
3.0	Sample Collection	3
4.0	Sample Characterization Results	6
5.0	Experimental Design	7
6.0	Experimental Procedures	8
6.1	General	8
6.2	Aerobic Flask Tests	9
6.3	Anaerobic Flask Tests	10
6.4	Soil Column Tests	11
7.0	Results	13
8.0	Findings	14
8.1	Surface Soil	14
8.2	Subsurface Soil	14
8.3	Sediment	15
8.4	All Soils	15
9.0	Conclusions	16

DRAFT

WESTON

MANAGERS DESIGNERS/CONSULTANTS

LIST OF ATTACHMENTS

1 Treatability Study Sample Locations

2 Chlorobenzene Characterization Results for Field Samples*

3 Geotechnical/Physical Characterization Results for Treatability Study Samples*

4 Test Matrix for Flask Studies

5 Test Matrix for Column Studies

6 Soil Column Test Apparatus Schematic

7 Chlorobenzene Results for Individual Samples*

8 Chloride and Nutrient Results*

9 Tabular Results Summaries*

10 Graphical Results Summaries*

* Not included in draft submittal of 17 September 1993, will be included in an addendum to the FS.

DRAFT

1.0 OVERVIEW

1.1 A bioremediation treatability study was conducted by Roy F. Weston, Inc. (WESTON®) for Standard Chlorine of Delaware, Inc. (SCD) in accordance with WESTON's December 1992 Work Plan.

1.2 The objective of the study was to evaluate the technical feasibility of bioremediation for the treatment of soils containing chlorobenzenes at the SCD, Delaware City, Delaware facility.

1.3 The treatability study consisted of a bench-scale screening program which included a series of aerobic and anaerobic flask tests as well as soil column tests.

1.4 The treatability study was conducted at WESTON's Environmental Technology Laboratory (ETL) in Lionville, Pennsylvania from February through May 1993.

1.5 Analyses of treatability study samples for chlorobenzenes was performed by the SCD laboratory at the Delaware City facility.

1.6 Analyses of treatability study samples for chloride, and nitrogen and phosphorus compounds was performed by WESTON's Analytical Laboratory in Lionville, Pennsylvania.

1.7 Geotechnical/physical characterization of the soil samples used in the treatability study was performed by WESTON's ETL.

DRAFT

AR308147

2.0 TEST PLANS

2.1 The technical approach and scope of the treatability study was developed in accordance with WESTON's discussions at meetings with SCD, DNREC and EPA.

2.2 A preliminary test plan for the treatability study is provided in WESTON's proposal to SCD dated 18 November 1992.

2.3 A detailed test plan for the treatability study is presented in WESTON's "Draft Work Plan for Bioremediation Treatability Testing for the Standard Chlorine of Delaware, Inc. Delaware City, DE Site" dated December 1992. This plan was submitted to DNREC and EPA for review and comment.

2.4 The Health and Safety Plan used for sample collection and treatability testing was the approved plan used for the RI.

2.5 The Quality Assurance Project Plan used for the sampling and analysis activities was the approved plan used for the RI.

DRAFT

AR308148

3.0 SAMPLE COLLECTION

3.1 Samples of the surface soil, subsurface soil, and sediment for use in the treatability study were collected from the SCD Delaware City facility by WESTON personnel on 7 January 1993. Since the subsurface soil samples collected on 7 January 1993 did not contain chlorobenzenes at the targeted concentrations, additional subsurface samples were collected by WESTON personnel on 25 January 1993.

3.2 All WESTON sampling activities were conducted in Level D.

3.3 The locations of the treatability study samples are indicated on the map provided in Attachment 1 (Figure 1).

3.4 The three surface soil samples collected on 7 January 1993 were designated SS-1-1, SS-1-2, and SS-1-3. Each sample was collected from a discrete location in the vicinity of RI Sample SS-19. The samples were collected manually from the 0 to 6 inch depth.

3.5 The three sediment samples collected on 7 January 1993 were designated SD-1-1, SD-1-2, and SD-1-3. Each sample was collected from a discrete location in the vicinity of RI Sample SSX-11. The samples were collected manually from the 0 to 6 inch depth. Leaves and vegetation were scraped off the top of the sediment prior to sample collection.

3.6 The three subsurface soil samples collected on 7 January 1993 were designated SBS-1-1, SBS-1-2, and SBS-1-3. Each sample was collected from a discrete location within a test pit dug in the vicinity of RI Sample SS-31. The samples were collected using a backhoe from a depth of approximately 4 feet.

DRAFT

AR308149

3.7 The two subsurface soil samples collected on 25 January 1993 were designated SBS-1-1 and SBS-2-1. Sample SBS-1-1 was collected from a discrete location within a test pit dug directly north of the railroad tracks. This sample was collected using a backhoe from a depth of 5 to 6 feet. Sample SBS-2-1 was collected from a discrete location within a test pit dug in the vicinity of the benzene tanks. This sample was collected using a backhoe from a depth of approximately 4 feet.

3.8 All samples were collected using decontaminated sampling tools (including the backhoe bucket).

3.9 All samples were screened in the field through a 1/4-inch sieve prior to placement in buckets and sample containers.

3.10 Each surface soil and sediment sample consisted of two, 3.5-gallon plastic buckets (one for aerobic tests and one for anaerobic tests). One bucket (to be used for anaerobic tests) was purged with nitrogen prior to sealing. Additionally, one, 125 mL VOA bottle and one, 950-mL amber glass bottle was filled with sample and submitted to the SCD laboratory for chlorobenzenes analysis.

3.11 Each subsurface soil sample consisted of two, 3.5-gallon plastic buckets (one for aerobic tests and one for anaerobic tests) and two, 5-gallon plastic buckets (for column tests). One 3.5-gallon bucket (to be used for anaerobic tests) and both 5-gallon buckets were purged with nitrogen prior to sealing. One undisturbed tube sample was also collected from each subsurface soil location. Additionally, one, 125-mL VOA bottle and one, 950-mL amber glass bottle was filled with sample and submitted to the SCD laboratory for chlorobenzenes analysis.

3.12 Chain-of-Custody documentation was completed for all samples.

DRAFT

3.13 Following collection, the bulk samples were transported to WESTON's ETL and stored under refrigeration (4°C) until they were used for treatability testing.

DRAFT

AR308151

4.0 SAMPLE CHARACTERIZATION RESULTS

4.1 The results of chlorobenzenes analyses for the surface soil, subsurface soil, and sediment samples collected on 7 and 25 January 1993 are summarized in tabular form in Attachment 2.

4.2 Based on the total chlorobenzene (TotCB) concentrations measured, the following samples were selected for use in the treatability study:

- Surface soil - Sample SS-1-3 (1/7/93), TotCB = 5,370 mg/kg
- Subsurface soil - Sample SBS-1-1 (1/25/93), TotCB = 1,080 mg/kg
- Sediment - Sample SD-1-3 (1/7/93), TotCB = 190 mg/kg

4.3 The results of geotechnical/physical testing conducted on the three treatability study samples are presented in Attachment 3.

DRAFT

AR308152

5.0 EXPERIMENTAL DESIGN

5.1 The bench-scale bioremediation study consisted of the following elements:

- Aerobic flask tests
- Anaerobic flask tests
- Soil column tests

5.2 Aerobic and anaerobic flask tests were conducted for the surface soil, subsurface soil, and sediment samples using three treatment conditions - inhibited control, nutrient amended, and nutrient amended/inoculated. For each treatment condition, a series of triplicate flasks were set up for analysis of samples at Day 0, 10, 30, and 60 of the test period.

5.3 A summary of the test matrix for the flask studies for chlorinated benzene and chloride/nutrient analyses is provided in Attachment 4, Tables 1 and 2.

5.4 Soil column tests were conducted for the subsurface soil sample only. The tests were conducted under anaerobic conditions using two soil columns - control column and nutrient column. For each column, triplicate soil and water feed samples were collected at Day 0 and Day 60 of the test period and triplicate column leachate samples were collected at Day 0, 10, 30, and 60 of the test period.

5.5 A summary of the test matrix for the column studies for chlorinated benzene and chloride/nutrient analyses is provided in Attachment 5, Tables 1 and 2.

5.7 The initiation of the flask tests was staggered over a period of 6 weeks to more evenly distribute the sample loading to the SCD laboratory.

DRAFT

AR308153

6.0 EXPERIMENTAL PROCEDURES

6.1 General

6.1.1 All treatability tests were conducted at room temperature (approximately 70°F).

6.1.2 The flasks for the aerobic tests were exposed to ambient building lighting during the course of the study.

6.1.3 The flasks for the anaerobic tests and the soil columns were isolated from ambient building lighting during the course of the study. The anaerobic flasks were placed inside a box and the columns were wrapped in aluminum foil.

6.1.4 Nutrient addition to the flasks and columns was targeted to provide an initial carbon:nitrogen weight ratio of 1:0.05.

6.1.5 At the required sampling interval (i.e., Day 0, 10, 30, and 60), the soil slurry contained in the aerobic and anaerobic test flasks was transferred to sample containers for analysis as follows:

- Chlorobenzenes - 100 mL, glass bottle; cool
- Chloride and O-PO_4 - 125 mL, plastic bottle; cool
- Nitrogen compounds and T-PO_4 - 500 mL, plastic bottle; H_2SO_4/cool

6.1.6 At the required sampling interval (i.e., Day 0, 10, 30, and 60), the soil, water feed, and column leachate samples from the column tests were collected for analysis in the following containers:

- Chlorobenzenes in soil - 500 mL, glass bottle ; cool

AR308154

- Chlorobenzenes in feed/leachate - 950 mL amber, glass bottle; cool and two, 40 mL VOA bottles; cool
- Chloride and O-PO_4 in feed/leachate - 125 mL, plastic bottle; cool
- Nitrogen compounds and T-PO_4 in feed/leachate - 125 mL, plastic bottle; H_2SO_4/cool

6.1.7 Following collection of the treatability study samples, they were packed in a cooler containing ice. Chain-of-Custody forms were completed and the samples were then transported to the analytical laboratory. Samples for chlorobenzenes analyses were delivered to the SCD laboratory by WESTON personnel or by a commercial courier service. Samples for chloride and nutrient analyses were delivered to the WESTON Lionville Analytical Laboratory by WESTON personnel.

DRAFT

6.2 Aerobic Flask Tests

6.2.1 The aerobic test flasks consisted of 250 mL, glass Erlenmeyer flasks containing approximately 100 mL (100 g) of soil slurry.

6.2.2 The slurry in the flasks was approximately 20% by weight soil in water.

6.2.3 The prepared flasks were placed on a shaker table and continuously agitated. Agitation provided for oxygenation and mixing of the soil slurry. The flasks were loosely covered with plastic caps to minimize evaporation losses.

6.2.4 The soil slurry for the control flasks of the aerobic tests was prepared by mixing the soil/sediment sample with fertilizer solution, formaldehyde (37%), and medium solution. The fertilizer solution consisted of either commercial fertilizer (20:20:20) or $(NH_4)_2HPO_4$. The medium solution contained KH_2PO_4, NaHPOH, and Resazurin. Resazurin is a redox indicator which is pink in the presence of oxygen and blue when oxygen is not present. All solutions were prepared using deionized water.

6.2.5 The soil slurry for the nutrient flasks of the aerobic tests was prepared by mixing the soil/sediment sample with fertilizer and medium solutions. These solutions were identical to those described in Item 6.2.4.

6.2.6 The soil slurry for the nutrient/inoculated flasks of the aerobic tests was prepared by mixing the soil/sediment sample with fertilizer solution, sludge inoculum, and medium solution. The fertilizer and medium solutions were identical to those described in Item 6.2.4. The sludge inoculum consisted of washed secondary activated sludge obtained from the aeration tank of the Goose Creek Wastewater Treatment Plant in West Chester, Pennsylvania.

6.3 Anaerobic Flask Tests

6.3.1 The anaerobic test flasks consisted of 125 mL glass serum bottles containing approximately 100 mL (100 g) of soil slurry.

6.3.2 The slurry in the serum bottles was approximately 50% by weight soil in water.

6.3.3 The prepared serum bottles were purged with nitrogen, tightly sealed, and placed inside a box. The bottles were occasionally shaken by hand to mix the contents.

6.3.4 The soil slurry for the control flasks of the anaerobic tests was prepared by mixing the soil/sediment sample with fertilizer solution, formaldehyde (37%), and medium solution. The fertilizer and medium solutions were identical to those described in Item 6.2.4.

6.3.5 The soil slurry for the nutrient flasks of the anaerobic tests was prepared by mixing the soil/sediment sample with fertilizer and medium solutions. These solutions were identical to those described in Item 6.2.4.

DRAFT

6.3.6 The soil slurry for the nutrient/inoculated flasks of the anaerobic tests was prepared by mixing the soil/sediment sample with fertilizer solution, sludge inoculum, and medium solution. The fertilizer and medium solutions were identical to those described in Item 6.2.4. The sludge inoculum consisted of washed anaerobic sludge obtained from the anaerobic digester of the West Goshen Wastewater Treatment Plant in West Chester, Pennsylvania.

6.4 Soil Column Tests

6.4.1 The soil column tests used glass columns (4-inch diameter by 4-feet long) containing approximately 12.5 kg of subsurface soil sample compacted to a height of 3 feet (equivalent to the measured in place soil density).

6.4.2 The prepared soil columns were mounted on a rack and covered with aluminum foil to prevent exposure to light.

6.4.3 A schematic of the soil-column test apparatus is provided in Attachment 6.

6.4.4 The feed water was added to columns on a continuous basis such that the soil was completely saturated with water and a standing water layer filled the top of the column.

6.4.5 The feed water for the control column consisted of tap water which was adjusted to pH 6.3 (i.e., pH of site groundwater) and de-oxygenenated by the addition of sodium sulfite (Na_2SO_3).

6.4.6 The feed water for the nutrient column was identical to the control column with the addition of a nutrient solution containing $(NH_4)_2PO_4$.

DRAFT

6.4.7 The equivalent 10-year leachate volume calculated for the column study was approximately 1,750 gallons.

6.4.8 The soil samples collected from the columns at the beginning and end of the study represent a composite sample of the entire contents of the column.

DRAFT

AR308158

7.0 RESULTS

7.1 The chlorobenzene data for the individual samples from the treatability study are summarized in tabular form in Attachment 7.

7.2 The chloride and nutrient data from the treatability study are summarized in tabular form in Attachment 8.

7.3 Tabular summaries of the data for results interpretation are provided in Attachment 9.

7.4 Graphical summaries of the data for results interpretation are provided in Attachment 10.

DRAFT

AR308159

8.0 FINDINGS

8.1 Surface Soil

8.1.1 All aerobic samples showed a significant initial reduction in total chlorinated benzenes and total chloride during the first 10 days of treatment (see Attachment 10, Figure 2). The rate of reduction leveled off during the subsequent treatment (10 to 60 days).

8.1.2 The anaerobic control sample showed relatively constant total chlorinated benzenes and total chloride over the test duration (see Attachment 10, Figure 3).

8.1.3 The anaerobic nutrient and nutrient/inoculated samples showed a general reduction in total chlorinated benzenes and an increase in total chloride.

8.2 Subsurface Soil

8.2.1 The aerobic nutrient and nutrient/inoculated samples showed a decrease in total chlorinated benzenes and a slight net increase in total chloride (see Attachment 10, Figure 4).

8.2.2 The aerobic control sample showed a slight net decrease of total chlorinated benzenes and total chloride over test duration.

8.2.3 The anaerobic control, nutrient and nutrient/inoculated samples showed a net increase in total chlorinated benzenes (see Attachment 10, Figure 5). All samples except the control sample showed an increase in total chloride.

DRAFT

AR308160

8.3 Sediment

8.3.1 The aerobic control and nutrient samples show a net decrease in total chlorinated benzenes (see Attachment 10, Figure 6). The nutrient inoculated sample data is sporadic and shows no trend.

8.3.2 The anaerobic shows a net increase in total chlorinated benzenes for all samples, with little change in total chloride (see Attachment 10, Figure 7).

8.4 All Soils

8.4.1 Nutrient levels in the samples as measured by nitrogen and phosphorous remained essentially constant throughout the test period. Nutrient concentrations were sufficient to maintain and stimulate biological growth during the test period.

DRAFT

9.0 CONCLUSIONS

9.1 The anaerobic surface soil flask test exhibited presumptive evidence of biodegradation of chlorinated benzenes. This evidence is seen in the general declining trend in total chlorinated benzenes in conjunction with the consistent increase in chlorides in the nutrient and nutrient/inoculated flasks (see Attachment 10, Figure 3). By comparison, total chlorides in the control flask exhibited no substantial change during the course of the test. The production of chlorides, in conjunction with the declining levels of total chlorinated benzenes is presumptive evidence of dechlorination of chlorinated benzenes, and the absence of chloride production in the control flask suggests that the observed changes in the test flasks may be attributable to biological activity.

Dechlorination of the higher chlorinated benzenes would be expected to result in the production of lower chlorinated benzenes, which would then be further dechlorinated. However, this effect may have been masked in these tests by the pre-existing levels of lower chlorinated benzenes, as clearly discernable trends among chlorinated benzenes were not observed.

9.2 The aerobic subsurface soil flask test also exhibited presumptive evidence of dechlorination of chlorinated benzenes based on the combination of declining trends in total chlorinated benzenes and the net increase in total chlorides in the nutrient and nutrient/inoculated tests (see Attachment 10, Figure 5). By comparison, chlorides in the control flask exhibited some scatter, but no overall trend was observed. The possible contribution of stripping (as shown in other aerobic tests) to the total removal of chlorinated benzenes in this test should be noted, and, as a result, the contribution of biological activity to chlorinated benzene removal cannot be definitively evaluated.

AR308162

9.3 The surface soil and sediment aerobic flask tests exhibited a high initial rate of total chlorinated benzene losses from the slurry-phase soil samples. The total chlorinated benzene losses are likely attributable to stripping rather than biodegradation since a concurrent increase in chloride levels was not measured. The stripping from the slurried soil samples may have been enhanced by the continuous stirring/agitation during the test period. Agitation was performed to maintain mixed aerobic conditions in the samples.

Because the treatability study was designed to test the biodegradability of the soils, the stripping effects encountered in the slurry-phase soils is not necessarily considered indicative of the strippability of in-situ soils. In situ soils would not undergo agitation, and are present in the solid phase rather than a slurry phase. For these reasons, the findings of the study are not considered applicable to other treatment technologies such as soil vapor extraction.

9.4 Anaerobic soil column tests exhibited total chlorinated benzene losses from the soil which are likely due to flushing of soluble chlorobenzenes during testing. The concentration of total chlorinated benzene found in the aqueous leachate from the initial flushes through the column accounted for essentially all of the quantity of chlorobenzenes removed from the soil columns. Both the control and nutrient-enriched columns exhibited similar results during the column tests.

9.5 Additional process development testing would be necessary to expand the application of biodegradation to a wider range of soils and conditions; specifically towards application in the wetland areas. Nutrient addition in these areas may promote natural degradation of contaminants, as seen in the anaerobic surface soil and aerobic subsurface soil tests.

DRAFT

AR308163

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 1

TREATABILITY STUDY SAMPLE LOCATIONS

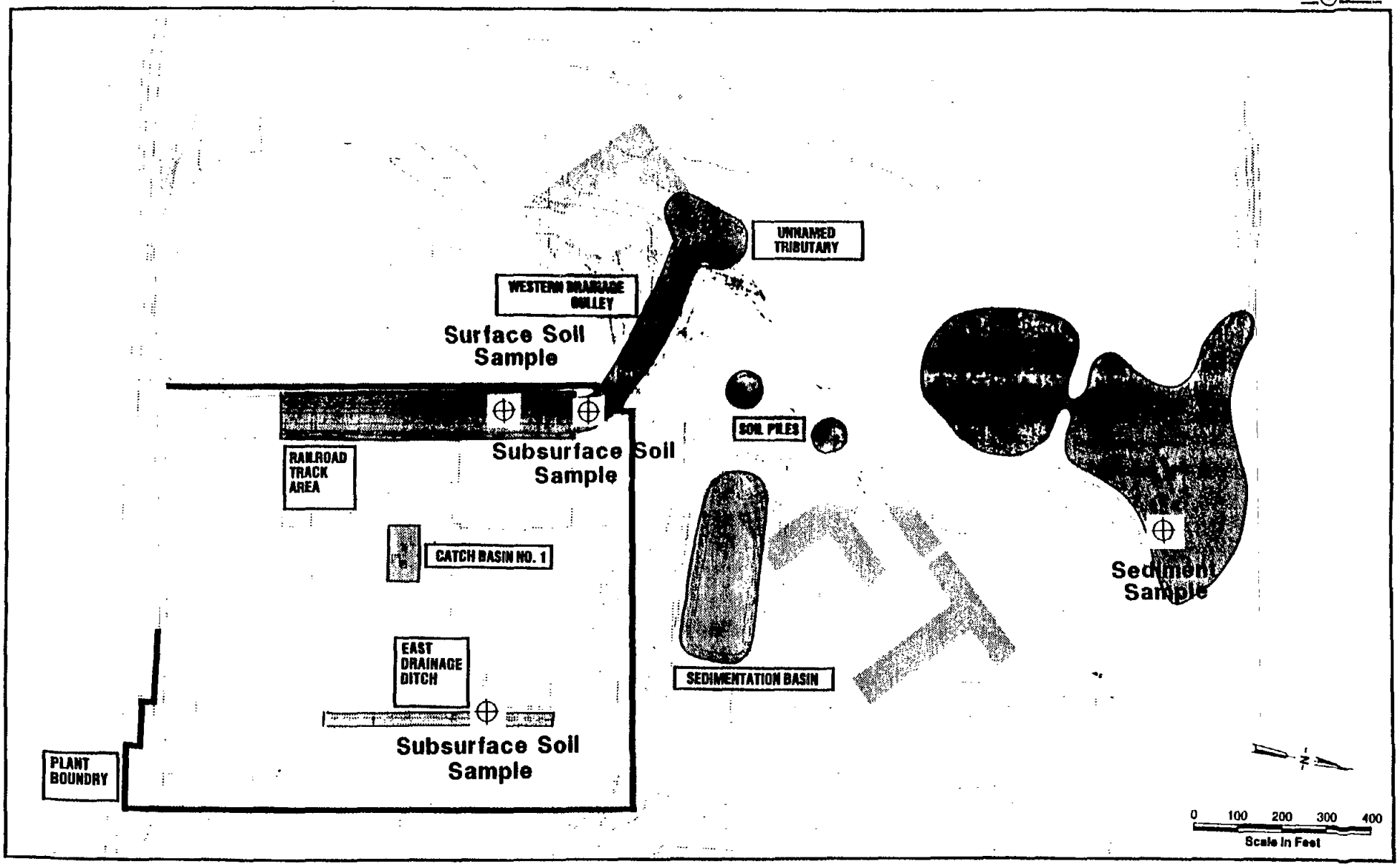


FIGURE 1 SAMPLE LOCATIONS

DRAFT

AR308165

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 2

CHLOROBENZENE CHARACTERIZATION RESULTS FOR FIELD SAMPLES

DATA SUMMARY
SAMPLE COLLECTION DATE 01/07/93

INITIAL CHARACTERIZATION SAMPLES

SAMPLE TYPE:	SEDIMENT			SUBSURFACE SOIL			SURFACE SOIL		
SAMPLE ID :	SD-1-1	SD-1-2	SD-1-3	SBS-1-1	SBS-1-2	SBS-1-3	SS-1-1	SS-1-2	SS-1-3
LAB # :	01073-01	01073-02	01073-03	01073-04	01073-05	01073-06	01073-07	01073-08	01073-09
MATRIX :	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
CONCENTRATION : dry basis	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	122,360	< 4,438	40,581	< 57	< 25	< 25	< 24	< 25,042	< 13,474
TOLUENE	< 10,147	< 4,438	< 4,203	< 57	< 25	< 25	< 24	< 25,042	< 13,474
ETHYLBENZENE	< 10,147	< 4,438	< 4,203	< 57	< 25	43	< 24	< 25,042	< 13,474
CHLOROBENZENE	250,152	18,458	103,766	< 85	< 37	< 37	< 37	< 37,563	23,922
1,4-DICHLOROBENZENE	151,624	< 6,656	31,765	142	< 37	< 37	< 37	800,123	541,596
1,3-DICHLOROBENZENE	27,945	< 6,656	< 6,304	< 85	< 37	< 37	< 37	69,007	45,612
1,2-DICHLOROBENZENE	98,272	< 6,656	12,749	< 85	< 37	< 37	< 37	212,345	181,467
1,3,5-TCB	< 122	< 293	< 477	< 228	< 62	< 121	< 60	< 53,545	< 20,827
1,2,4-TCB	11,831	31,490	24,765	7,436	7,591	5,955	3,597	7,433,648	3,215,359
1,2,3-TCB	4,089	10,312	7,565	1,831	2,674	2,485	2,500	2,134,613	972,609
1,2,4,5-TeCB	1,052	2,352	1,510	1,334	1,010	1,334	1,299	147,991	71,004
1,2,3,4-TeCB	1,397	3,483	2,740	2,275	3,066	4,493	2,139	554,370	264,937
PENTACHLOROBENZENE	173	926	2,365	470	753	930	828	68,958	43,773
HEXACHLOROBENZENE	< 122	< 244	< 477	< 228	< 62	< 161	89	< 2,677	< 2,083
NITROBENZENE	< 244	< 202	< 198	< 124	< 124	< 124	< 121	2,990	1,313
MCNB	< 367	< 302	< 296	< 186	< 186	< 186	< 181	< 180	< 169

Analysis Codes: < = Compound was not detected at or above the reporting limit shown. Subsequent dilutions were not run to determine lower detection limits.

DRAFT

AR308167

DATA SUMMARY
SAMPLE COLLECTION DATE 01/07/93

INITIAL CHARACTERIZATION SAMPLES
CHLOROBENZENE TOTALS

Parameter (ug/Kg)	Sample Type								
	Sediment			Subsurface Soil			Surface Soil		
	SD-1-1	SD-1-2	SD-1-3	SBS-1-1	SBS-1-2	SBS-1-3	SS-1-1	SS-1-2	SS-1-3
Mono-	250,152	18,458	103,766	43	19	19	19	18,782	23,922
Di-	277,841	9,984	47,666	227	56	56	56	1,081,475	768,675
Tri-	15,981	41,949	32,569	9,381	10,296	8,501	6,127	9,595,034	4,198,382
Tetra-	2,449	5,835	4,250	3,609	4,076	5,827	3,438	702,361	335,941
Penta-	173	926	2,365	470	753	930	828	68,958	43,773
Hexa-	61	122	239	114	31	81	89	1,339	1,042
Total Chlorobenzenes	546,657	77,274	190,854	13,844	15,230	15,412	10,556	11,467,948	5,371,734

DRAFT

DRAFT

AR308168

DATA SUMMARY
SAMPLE COLLECTION DATE 01/25/93

INITIAL CHARACTERIZATION SAMPLES

SAMPLE TYPE :	SUBSURFACE SOIL	
SAMPLE ID :	SBS-1-1	SBS-2-1
LAB # :	01253-01	01253-02
MATRIX :	SOIL	SOIL
CONCENTRATION : dry basis	(ug/Kg)	(ug/Kg)
BENZENE	< 9,777	< 27
TOLUENE	< 9,777	< 27
ETHYLBENZENE	< 9,777	< 27
CHLOROBENZENE	< 14,666	< 41
1,4-DICHLOROBENZENE	226,085	< 41
1,3-DICHLOROBENZENE	20,019	< 41
1,2-DICHLOROBENZENE	96,507	< 41
1,3,5-TCB	< 4,011	< 317
1,2,4-TCB	485,713	1,543
1,2,3-TCB	152,441	< 317
1,2,4,5-TeCB	19,629	517
1,2,3,4-TeCB	58,372	407
PENTACHLOROBENZENE	14,270	69
HEXACHLOROBENZENE	< 501	< 54
NITROBENZENE	< 1,003	< 108
MCNB	< 165	< 162

Analysis Codes: < = Compound was not detected at or above the reporting limit. Subsequent dilutions were not run to determine lower detection limits.

DRAFT

AR308169

DATA SUMMARY
SAMPLE COLLECTION DATE 01/25/93

INITIAL CHARACTERIZATION SAMPLES
CHLOROBENZENE TOTALS

Parameter (µg/Kg)	Sample Type	
	Subsurface Soil	
	SBS-1-1	SBS-2-1
Mono-	7,333	21
Di-	342,611	62
Tri-	640,160	1,860
Tetra-	78,001	924
Penta-	14,270	69
Hexa-	251	27
Total Chlorobenzenes	1,082,625	2,962

DRAFT

DRAFT

AR308170

WESTON
MANAGERS DESIGNERS/CONSULTANTS

ATTACHMENT 3

GEOTECHNICAL/PHYSICAL CHARACTERIZATION RESULTS FOR TREATABILITY STUDY SAMPLES

Inter-Office Memorandum

WESTON
MANAGERS DESIGNERS/CONSULTANTS

TO: Tom Drew

FROM: Russell Frye (WB for) DATE: 10 March 1993

PROJECT: Standard Chlorine W.O. NO.: 02267-012-001

SUBJECT: **Geotechnical Testing Results**

ACTION:

Geotechnical testing results for the Standard Chlorine project are attached. Three (3) soil samples, job number 9302X006 were submitted to WESTON's Environmental Technology Laboratory (ETL) on 18 February 1993 for geotechnical testing.

The geotechnical tests requested are presented in the attached custody transfer/work request.

The geotechnical tests performed including reference method and test number are presented in Table 1.

If you require additional information or have any questions, please call me at (215) 524-6173.

W 04-08-004/A-5/85

Table 1 Geotechnical Tests Performed, Reference Methods and Test Numbers		
Test Parameter	**Method[1]**	**Test Numbers**
Grain Size by Sieve and Hydrometer	D 421/422	3
Liquid and Plastic Limits	D 4318	3
Natural Moisture Content	D 2216	3
Permeability of Fine Grain Soils	D 5084	3

DRAFT

[1] All analytical methods derived from the Annual Book of ASTM Standards, Section 4, Volume 4.08, Soil and Rock; Building Stones; Geotextiles, American Society of Testing Materials, Philadelphia, PA, 19[illegible] unless noted otherwise.

WESTON Analytics Use Only

9[redacted]006

Custody Transfer R[redacted]rd/Lab Work Request

P[redacted] of

Client: STANDARD CHLORINE

Est. Final Proj. Sampling Date:

Work Order #: 02267-012-001-0150

Project Contact/Phone #: Tom Dizzy / 7302

AD Project Manager: R. FRYE / J. MARTINO

QC: Del: TAT:

Date Rec'd: Date Due:

Account #:

Refrigerator #																
#/Type Container	Liquid															
	Solid															
Volume	Liquid															
	Solid															
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN	1			2		
		WESTON Analytics Use Only														

MATRIX CODES:
S - Soil
SE - Sediment
SD - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
Drum Liquids
EP/TCLP Leachate
WP - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
001	SBS-1-1			S	1/25/93											X			X		
002	SS-1-3			S	1/7/93											X					
003	SD-1-3			S	1/7/93											X					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

1 NMC, GSC, LPL; USCS CLASS.

2 - HCF, BDS FROM TUBE

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# _____ Cooler# _____ 381-596a

AR308174

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Standard Chlorine	PROJECT SAMPLE I.D.	SBS-1-1	PROJECT ANALYST	WB
JOB NUMBER	9302X006	ETL SAMPLE NUMBER	001	QA/QC ANALYST	RWF
W. O. NUMBER	02267-012-001-0150	DATE RECEIVED	2/18/93	DATE COMPLETED	03/03/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	93.4
#4	4.750	79.8
#10	2.000	66.5
#20	0.850	53.0
#50	0.300	28.3
#100	0.150	21.4
#200	0.075	19.4
HYDROMETER	0.0439	17.5
	0.0315	16.4
	0.0225	15.8
	0.0163	13.5
	0.0119	13.5
	0.0086	11.7
	0.0062	10.6
	0.0044	9.4
	0.0031	8.8
	0.0022	8.3
	0.0013	6.5
	0.0009	6.5

EFFECTIVE SIZES

% Finer	Diameter mm
60	1.449
30	0.339
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

9.6

SAMPLE DESCRIPTION

dark brown gravelly, silty and clayey SAND with 20% gravel and 19% silt and clay of low plasticity

Unified Soil Classification System (USCS) Group Symbol

SM/SC

INDEX PROPERTIES

% moisture dry basis

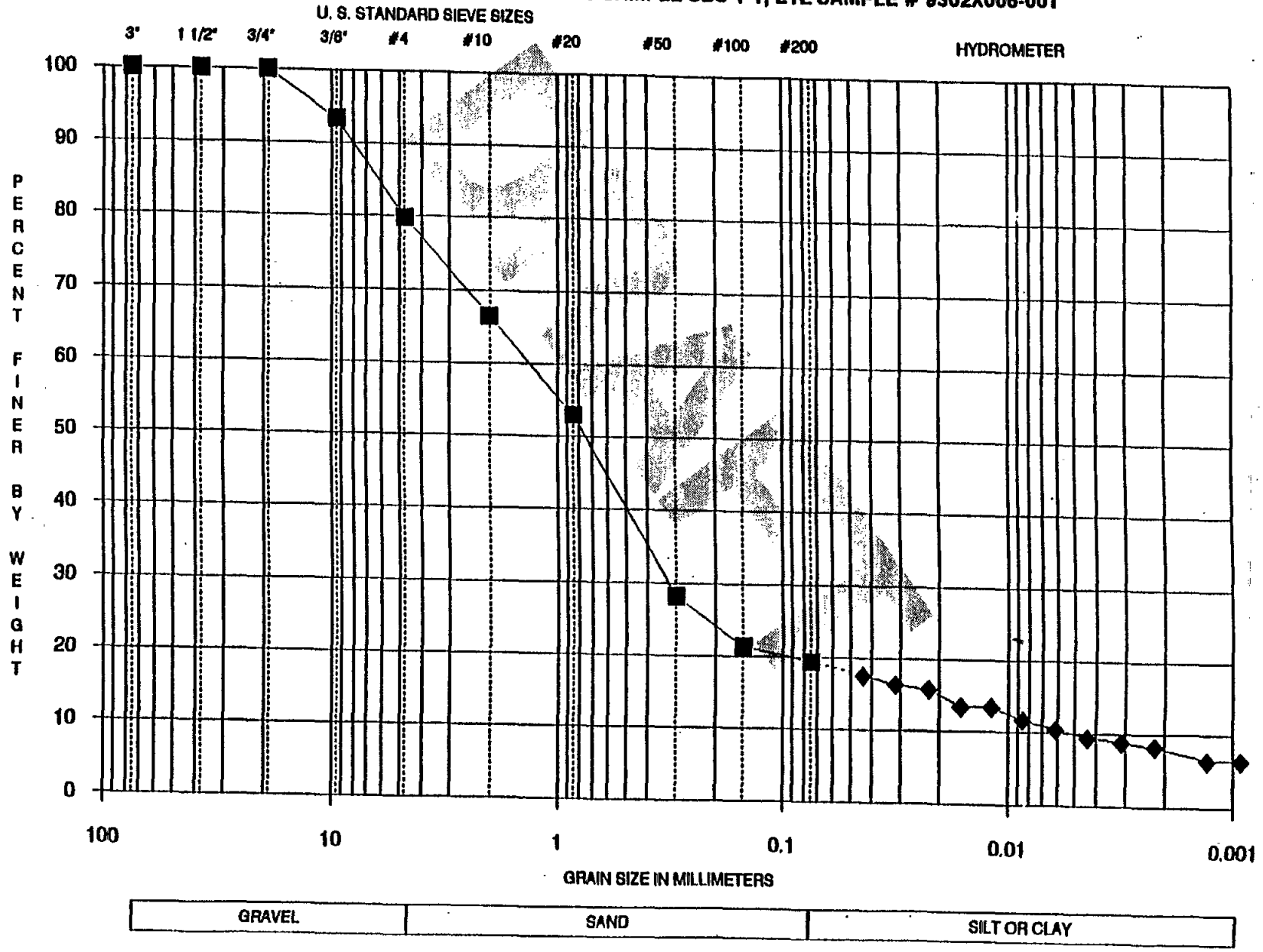
Liquid Limit	Plastic Limit	Plasticity Index
22.6	16.4	6.2

NOTES

NA=NOT APPLICABLE

AR308175

PARTICLE-SIZE DISTRIBUTION CURVE FOR STANDARD CHLORINE PROJECT SAMPLE SBS-1-1, ETL SAMPLE # 9302X006-001



WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Standard Chlorine	PROJECT SAMPLE I.D.	SS-1-3	PROJECT ANALYST	WB
JOB NUMBER	9302X006	ETL SAMPLE NUMBER	002	QA/QC ANALYST	RWF
W. O. NUMBER	02267-012-001-0150	DATE RECEIVED	2/18/93	DATE COMPLETED	03/03/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	98.1
#4	4.750	97.6
#10	2.000	96.8
#20	0.850	95.3
#50	0.300	75.4
#100	0.150	66.3
#200	0.075	63.9
HYDROMETER	0.0342	58.7
	0.0245	57.7
	0.0193	47.0
	0.0145	39.6
	0.0112	32.1
	0.0082	26.8
	0.0059	24.7
	0.0042	22.6
	0.0030	20.4
	0.0022	18.3
	0.0013	16.2
	0.0009	15.1

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

20.9

SAMPLE DESCRIPTION

light brown gravelly and sandy SILT and CLAY of low plasticity with 2% gravel and 34% sand

Unified Soil Classification System (USCS) Group Symbol

ML/CL

INDEX PROPERTIES

% moisture dry basis

Liquid Limit	Plastic Limit	Plasticity Index
23.9	19.5	4.4

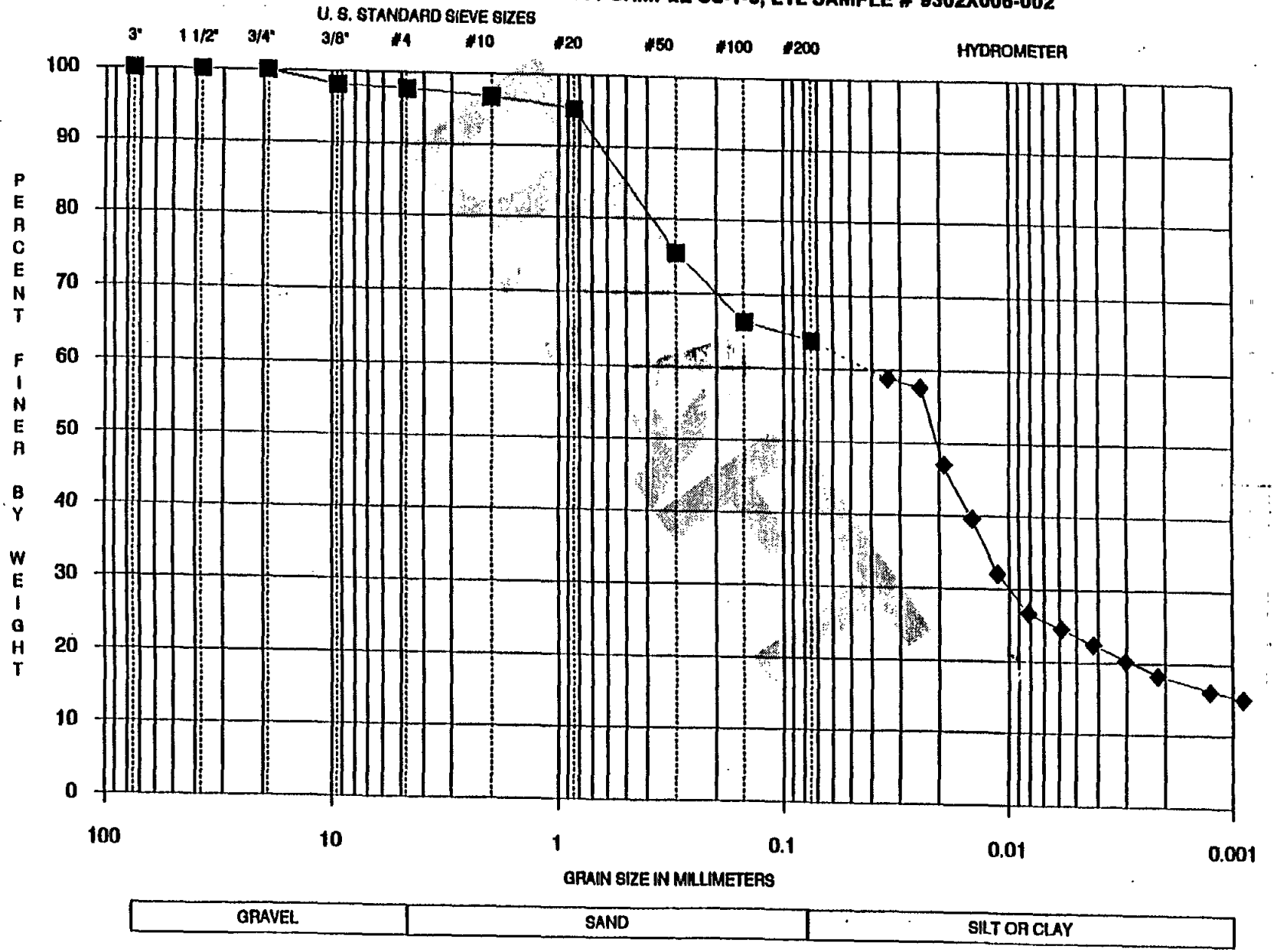
NOTES

NA=NOT APPLICABLE

AR308177

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

PARTICLE-SIZE DISTRIBUTION CURVE FOR STANDARD CHLORINE PROJECT SAMPLE SS-1-3, ETL SAMPLE # 9302X006-002



AR308178

WESTON ENVIRONMENTAL TECHNOLOGY LABORATORY

GEOTECHNICAL TESTING DATA AND RESULTS

PROJECT	Standard Chlorine	PROJECT SAMPLE I.D.	SD-1-3	PROJECT ANALYST	WB
JOB NUMBER	9302X006	ETL SAMPLE NUMBER	003	QA/QC ANALYST	RWF
W. O. NUMBER	02267-012-001-0150	DATE RECEIVED	2/18/93	DATE COMPLETED	03/03/93

PARTICLE SIZE DISTRIBUTION

U. S. Standard Sieve Size	Diameter mm	% Finer
3"	75.00	100.0
1 1/2"	37.50	100.0
3/4"	19.00	100.0
3/8"	9.500	100.0
#4	4.750	100.0
#10	2.000	99.4
#20	0.850	98.8
#50	0.300	98.0
#100	0.150	97.5
#200	0.075	96.2
HYDROMETER	0.0388	74.4
	0.0285	68.1
	0.0204	66.5
	0.0151	58.6
	0.0117	46.0
	0.0084	44.5
	0.0061	36.6
	0.0045	25.5
	0.0032	22.4
	0.0023	19.2
	0.0014	12.9
	0.0010	9.8

EFFECTIVE SIZES

% Finer	Diameter mm
60	NA
30	NA
10	NA
Uniformity Coefficient	Gradation Coefficient
NA	NA

NATURAL MOISTURE CONTENT, % dry basis

112.2

SAMPLE DESCRIPTION

gray sandy SILT of high plasticity with 4% sand

Unified Soil Classification System (USCS) Group Symbol

MH

INDEX PROPERTIES

% moisture dry basis

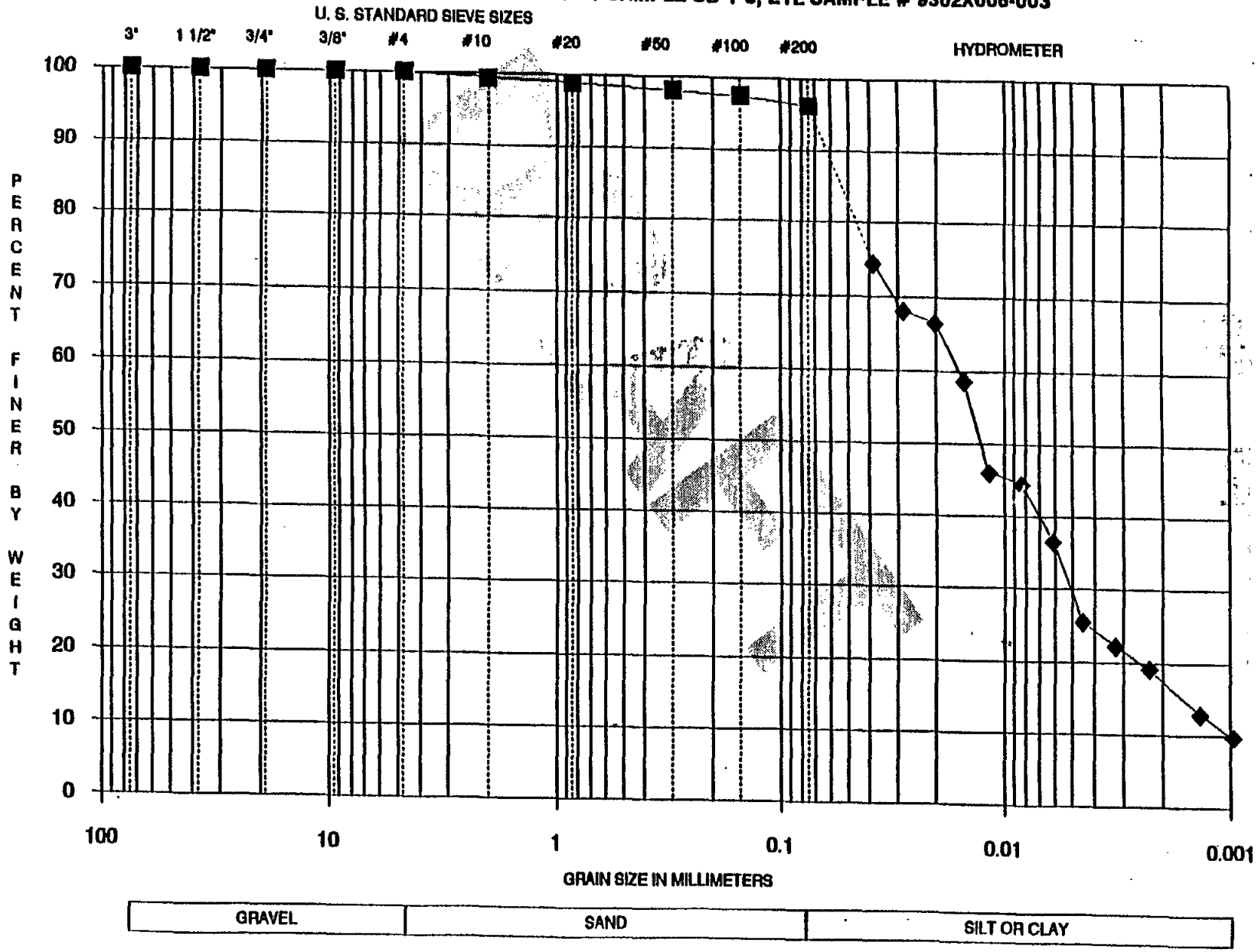
Liquid Limit	Plastic Limit	Plasticity Index
60.7	48.1	12.7

NOTES

NA=NOT APPLICABLE

AR308179

PARTICLE-SIZE DISTRIBUTION CURVE FOR STANDARD CHLORINE PROJECT SAMPLE SD-1-3, ETL SAMPLE # 9302X006-003



AR308180

ASTM D 5084 - HYDRAULIC CONDUCTIVITY OF SATURATED MATERIALS USING A FLEXI-WALL PERMEAMETER WITH BACK PRESSURE

PROJECT	Standard Chlorine	PROJECT SAMPLE I. D.	SBS-1-1
W. O. NUMBER	02267-012-001-0150	ETL SAMPLE NUMBER	1
JOB NUMBER	9302X006	TEST PERIOD	02/22/93 to 03/09/9

SPECIMEN DESCRIPTION

undisturbed soil sample collected in 2.5" diameter by 6" long brass tube; sample is a dark brown gravelly, silty and clayey sand

SPECIMEN DATA	Initial(1)	Final(2)
Wet Weight, grams	504.6	535.2
Dry Weight, grams	466.8	468.9
Diameter, cm	6.20	5.84
Length, cm	8.96	8.25
Volume, cc	270.5	220.9
Moisture Content, % dry	8.1	14.1
Wet Unit Weight, pcf	116.4	151.2
Dry Unit Weight, pcf	107.7	132.5
Specific Gravity	2.67	2.67
Void Ratio	0.55	0.26
Porosity, %	35.3	20.4
Pore Volume, cc	95.5	45.1
Degree of Saturation, %	39.5	146.9

TEST CRITERIA	
Soil Type, USCS Classification	SC
Average Sample Depth, feet	5
Average Wet Unit Weight, pcf	115
Effective Stress Envelope, degrees	31
Earth Pressure Coefficent, Ko	0.48
Effective Horizontal Stress, psi	1.9
Maximum Differential Pressure, psi	0.9
Maximum Possible Gradient	8.0
Selected Target Gradient	8.0
Target Cell Pressure, psi	63.0
Target Outlet Pressure, psi	60.0
Target Inlet Pressure, psi	62.0

SATURATED HYDRAULIC CONDUCTIVITY AVERAGE TEST RESULTS (3)	
Cell Pressure, psi	63.1
Outlet Pressure, psi	60.0
Inlet Pressure, psi	62.2
Differential Pressure, psi	2.2
Confining Pressure, psi	3.1
Hydraulic Gradient	18.4
Inlet Volume/Outlet Volume Ratio	1.01
Permeation Volume, pore volumes	29.19
Hydraulic Conductivity, cm/sec	1.76 E-05

NOTES

(1) Initial conditions: undisturbed soil sample collected in 2.5" diameter by 6" long brass tube; sample is a dark brown gravelly, silty and clayey sand

(2) Final conditions: conditions after saturation and consolidation at reported maximum confining pressure

(3) Average of last four measurements

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 4

TEST MATRIX FOR FLASK STUDIES

ATTACHMENT 4
TABLE 1
FLASK TEST MATRIX: CHLOROBENZENE ANALYSES

SAMPLE	TEST TYPE	TEST CONDITION	MATRIX	NO. OF SAMPLES				
				DAY 0	DAY 10	DAY 30	DAY 60	TOTAL
SURFACE SOIL	AEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
	ANAEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
SUBSURFACE SOIL	AEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
	ANAEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
SEDIMENT	AEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
	ANAEROBIC	CONTROL	SOIL SLURRY	3	3	3	3	12
		NUTRIENT	SOIL SLURRY	3	3	3	3	12
		NUTRIENT/INOCULATED	SOIL SLURRY	3	3	3	3	12
TOTAL				54	54	54	54	216

AR308183

ATTACHMENT 4
TABLE 2
FLASK TEST MATRIX: CHLORIDE/NUTRIENT ANALYSES

SAMPLE	TEST TYPE	TEST CONDITION	MATRIX	NO. OF SAMPLES				
				DAY 0	DAY 10	DAY 30	DAY 60	TOTAL
SURFACE SOIL	AEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
	ANAEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
SUBSURFACE SOIL	AEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
	ANAEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
SEDIMENT	AEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
	ANAEROBIC	CONTROL	SOIL SLURRY	1	1	1	1	4
		NUTRIENT	SOIL SLURRY	1	1	1	1	4
		NUTRIENT/INOCULATED	SOIL SLURRY	1	1	1	1	4
TOTAL				18	18	18	18	72

WESTON

AR308184

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 5

TEST MATRIX FOR COLUMN STUDIES

ATTACHMENT 5
TABLE 1
COLUMN TEST MATRIX: CHLOROBENZENE ANALYSES

SAMPLE	TEST TYPE	TEST CONDITION	MATRIX	NO. OF SAMPLES				
				DAY 0	DAY 10	DAY 30	DAY 60	TOTAL
SUBSURFACE SOIL	ANAEROBIC	CONTROL	SOIL	3	0	0	3	6
			WATER FEED	3	0	0	3	6
			COLUMN LEACHATE	3	3	3	3	12
		NUTRIENT	SOIL	3	0	0	3	6
			WATER FEED	3	0	0	3	6
			COLUMN LEACHATE	3	3	3	3	12
TOTAL				18	6	6	18	48

WESTON

AR308186

ATTACHMENT 5
TABLE 2
COLUMN TEST MATRIX: CHLORIDE/NUTRIENT ANALYSES

SAMPLE	TEST TYPE	TEST CONDITION	MATRIX	NO. OF SAMPLES				
				DAY 0	DAY 10	DAY 30	DAY 60	TOTAL
SUBSURFACE SOIL	ANAEROBIC	CONTROL	SOIL	0	0	0	0	0
			WATER FEED	1	0	0	1	2
			COLUMN LEACHATE	1	1	1	1	4
		NUTRIENT	SOIL	0	0	0	0	0
			WATER FEED	1	0	0	1	2
			COLUMN LEACHATE	1	1	1	1	4
TOTAL				4	2	2	4	12

DRAFT

WESTON
MANAGERS
ENGINEERS-CONSULTANTS

AR308187

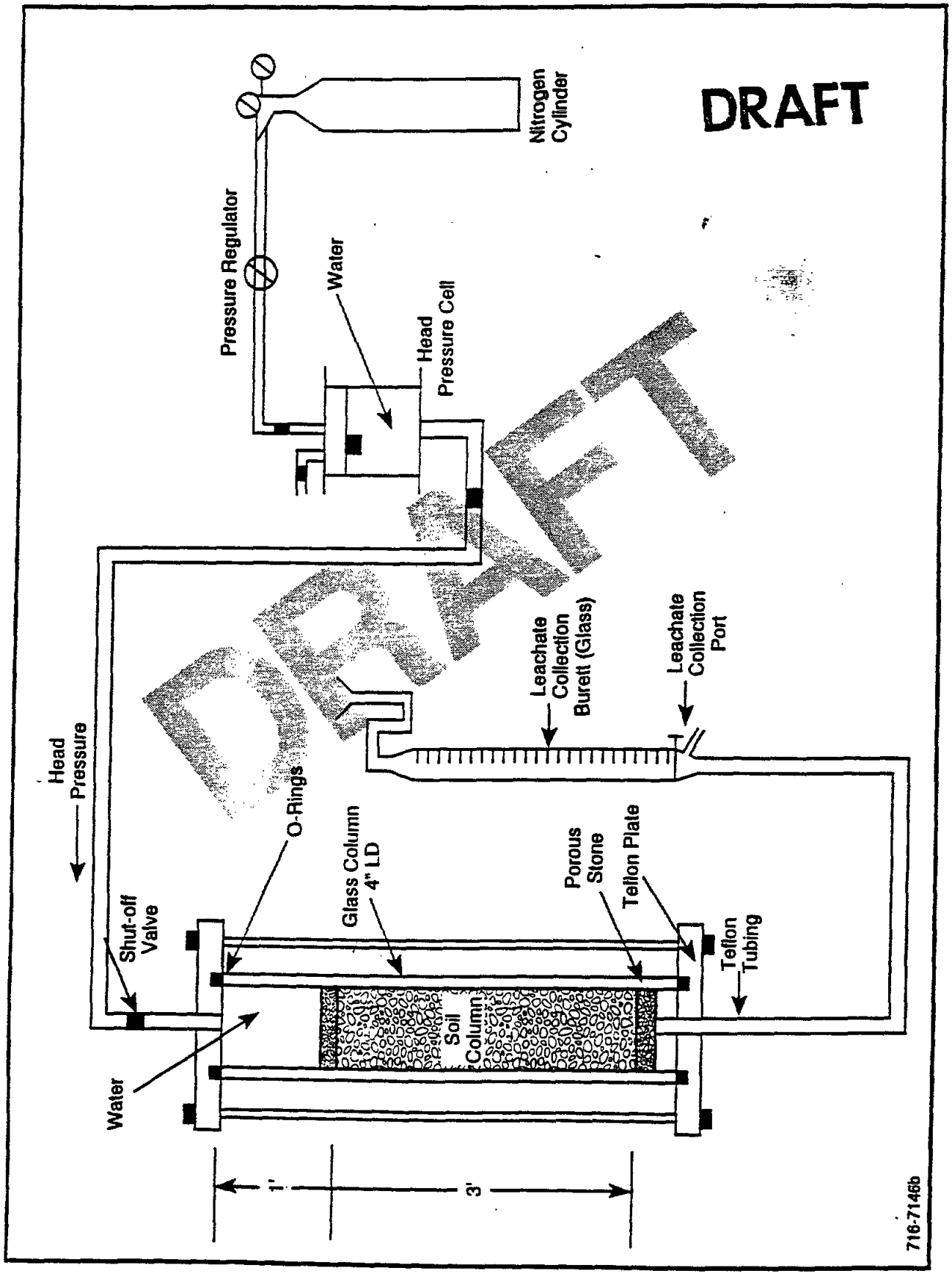
WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 6

SOIL COLUMN TEST APPARATUS SCHEMATIC

WESTON


DRAFT
Nitrogen Cylinder
Pressure Regulator
Water
Head Pressure Cell
Head Pressure
Leachate Collection Buret (Glass)
Leachate Collection Port
O-Rings
Glass Column 4" LD
Porous Stone
Teflon Plate
Shut-off Valve
Teflon Tubing
Soil Column
Water
1'
3'
716-7146b

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 7

CHLOROBENZENE RESULTS FOR INDIVIDUAL SAMPLES

SAMPLE ID CODES -SCD

Biological Treatability Samples

Empirical Sample ID: X-Y-ZZ-T-S

where:

X = Soil Type
- A = Surface
- B = Subsurface
- C = Sediement

Y = Chemical additive
- N = Nutrient
- NI = Nutrient + innoculated
- C = Control

ZZ = Treatment method
- AE = Aerobic
- AN = Anaerobic

T = Time Interval (# days)

S = Triplicate Sequence # (1,2, or 3)

Example:

A-N-AE-10-1

Surface Soil-Nutrient-Aerobic-10 days-1

Column Leachate Study Samples

Empirical Sample ID: X-Y-ZZ-W-T-S

where:

X = Soil Type
- B = Subsurface

Y = Chemical additive
- N = Nutrient
- C = Control
- BN = Background nutrient
- BC = Background control

ZZ = Treatment method
- CL = Column Leach

W = Matrix
- S = Soil
- W = Water

T = Time Interval (# days)

S = Triplicate Sequence # (1,2, or 3)

Example:

B-N-CL-0-1

Subsurface soil-nutrient-column leach-0 days-1

DRAFT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 7A

SURFACE SOIL FLASK TESTS

DATA SUMMARY
SAMPLE COLLECTION DATE 02/16/93

SAMPLE ID :	A-C-AE-0-1	A-C-AE-0-2	A-C-AE-0-3	A-N-AE-0-1	A-N-AE-0-2	A-N-AE-0-3	A-NI-AE-0-1	A-NI-AE-0-2	A-NI-AE-0-3
LAB # :	02173-01	02173-02	02173-03	02173-05	02173-06	02173-07	02173-09	02173-10	02173-11
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	< 22,714 u	< 21,458 u	< 20,187 u	229 u	140 u	212 u	213 u	249 u	208 u
TOLUENE	< 22,714 u	< 21,458 u	< 20,187 u	191 u	275 u	180 u	218 u	146 u	290 u
ETHYLBENZENE	< 22,714 u	< 21,458 u	< 20,187 u	< 15,676 u	< 18,194 u	< 11,825 u	< 13,813 u	< 11,739 u	< 13,565 u
CHLOROBENZENE	8,635 u	9,638 u	9,019 u	7,140 u	8,054 u	4,420 u	5,870 u	4,947 u	5,902 u
1,4-DICHLOROBENZENE	415,809	533,009	543,017	370,803	366,739	320,100	352,890	279,501	200,600
1,3-DICHLOROBENZENE	< 34,071 u	< 32,187 u	34,546	24,630	24,616 u	20,949	25,036	19,696	< 20,348 u
1,2-DICHLOROBENZENE	123,474	154,295	162,371	112,326	104,372	90,301	105,559	83,986	67,295
1,3,5-TCB	3,018 u	8,226 u	8,802 u	6,977 u	2,444 u	1,123 u	244 u	1,885 u	3,510 u
1,2,4-TCB	1,002,723	2,284,881	2,675,700	2,076,375	834,070	472,063	119,971	588,693	1,097,377
1,2,3-TCB	292,783	687,740	827,837	636,505	281,075	162,121	41,566	191,788	343,872
1,2,4,5-TeCB	49,448	125,795	128,746	88,850	152,623	39,442	17,396	42,684	63,420
1,2,3,4-TeCB	188,127	434,361	497,882	343,181	370,403	170,115	112,519	141,751	220,381
PENTACHLOROBENZENE	47,451	71,314	53,287	51,658	25,756	11,947	24,020	23,029	67,193
HEXACHLOROBENZENE	1,139 u	4,656 u	1,617 u	1,240 u	827 u	599 u	1,134 u	715 u	1,745 u
NITROBENZENE	< 1,083 u	< 980 u	< 941 u	< 706 u	< 859 u	< 542 u	< 634 u	< 528 u	< 610 u
MCNB	< 1,625 u	< 1,470 u	< 1,411 u	< 1,058 u	< 1,289 u	< 813 u	< 952 u	< 792 u	< 915 u

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308193

DATA SUMMARY
SAMPLE COLLECTION DATE 02/25/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	A-C-AE-10-1 02263-01 SLURRY (ug/Kg)	A-C-AE-10-2 02263-02 SLURRY (ug/Kg)	A-C-AE-10-3 02263-03 SLURRY (ug/Kg)	A-N-AE-10-1 02263-05 SLURRY (ug/Kg)	A-N-AE-10-2 02263-06 SLURRY (ug/Kg)	A-N-AE-10-3 02263-07 SLURRY (ug/Kg)	A-NI-AE-10-1 02263-09 SLURRY (ug/Kg)	A-NI-AE-10-2 02263-10 SLURRY (ug/Kg)	A-NI-AE-10-3 02263-11 SLURRY (ug/Kg)
BENZENE	5 u	5 u	6 u	< 145 u	7 u	5 u	5 u	< 142 u	4 u
TOLUENE	< 136 u	< 135 u	< 140 u	< 145 u	< 185 u	< 193 u	< 144 u	< 142 u	< 136 u
ETHYLBENZENE	< 136 u	< 135 u	< 140 u	< 145 u	< 185 u	< 193 u	< 144 u	< 142 u	< 136 u
CHLOROBENZENE	23 u	28 u	26 u	16 u	26 u	19 u	18 u	10 u	19 u
1,4-DICHLOROBENZENE	123 u	134 u	175 u	40 u	85 u	49 u	48 u	67 u	58 u
1,3-DICHLOROBENZENE	< 204 u	< 202 u	< 210 u	< 217 u	86 u	38 u	< 216 u	< 213 u	44 u
1,2-DICHLOROBENZENE	43 u	53 u	54 u	37 u	96 u	51 u	49 u	16 u	63 u
1,3,5-TCB	194	172 u	105 u	185 u	237 u	213 u	225	104 u	269
1,2,4-TCB	24,600	22,788	19,181	22,070	26,859	19,764	13,399	9,066	25,489
1,2,3-TCB	7,899	10,222	4,954	20,587	20,091	6,657	4,691	2,975	9,654
1,2,4,5-TeCB	5,088	6,843	7,487	3,035	5,226	3,767	2,404	1,936	5,387
1,2,3,4-TeCB	9,922	12,025	23,418	9,183	17,182	12,236	8,090	6,490	20,979
PENTACHLOROBENZENE	3,236	4,543	7,741	3,600	4,407	5,547	4,470	2,705	16,277
HEXACHLOROBENZENE	566	708	1,679	818	637	781	619	378	2,935
NITROBENZENE	< 722 u	< 667 u	< 683 u	< 758 u	< 920 u	< 965 u	< 732 u	< 707 u	< 690 u
MCNB	< 1,084 u	< 1,000 u	< 1,024 u	< 1,137 u	< 1,380 u	< 1,447 u	< 1,099 u	< 1,061 u	< 1,034 u

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308194

DATA SUMMARY
SAMPLE COLLECTION DATE 03/18/93

SAMPLE ID :	A-C-AE-30-1	A-C-AE-30-2	A-C-AE-30-3	A-N-AE-30-1	A-N-AE-30-2	A-N-AE-30-3	A-NI-AE-30-1	A-NI-AE-30-2	A-NI-AE-30-3
LAB # :	03183-09	03183-10	03183-11	03183-01	03183-02	03183-03	03183-05	03183-06	03183-07
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	42 U	17 U	42 U	< 213 U	< 225 U	< 228 U	< 235 U	223 U	< 96 U
TOLUENE	< 303 U	30 U	51 U	< 213 U	< 225 U	< 228 U	< 235 U	152 U	< 96 U
ETHYLBENZENE	49 U	< 212 U	55 U	173 U	146 U	194 U	62 U	610	24 U
CHLOROBENZENE	116 U	63 U	90 U	52 U	62 U	46 U	54 U	146 U	18 U
1,4-DICHLOROBENZENE	291 U	171 U	258 U	33 U	101 U	162 U	142 U	< 441 U	70 U
1,3-DICHLOROBENZENE	< 454 U	< 318 U	< 394 U	< 319 U	< 338 U	< 342 U	< 352 U	229 U	< 144 U
1,2-DICHLOROBENZENE	226 U	157 U	207 U	< 319 U	< 338 U	< 342 U	< 352 U	157 U	< 144 U
1,3,5-TCB	< 751 U	32 U	216 U	56 U	< 726 U	19 U	< 595 U	4 U	238 U
1,2,4-TCB	5,831	1,892	117,957	42,606	8,112	12,818	1,990	5,965	2,916
1,2,3-TCB	631	329	23,714	7,893	1,630	2,826	440 U	1,818	938
1,2,4,5-TeCB	3,165	1,229	23,058	10,769	3,233	3,406	937	2,864	1,085
1,2,3,4-TeCB	1,979	3,340	35,687	9,238	5,352	7,029	2,828	9,175	2,719
PENTACHLOROBENZENE	1,231	1,915	4,625	2,019	1,837	2,136	1,292	3,966	1,107
HEXACHLOROBENZENE	535 U	256 U	500 U	2,408 U	16 U	198 U	134 U	339 U	122 U
NITROBENZENE	4,051 U	3,209 U	< 1,330 U	1,027 U	< 1,130 U	1,096 U	< 1,191 U	< 1,447 U	< 475 U
MCNB	923 U	2,489 U	1,639 U	1,540 U	515 U	353 U	< 1,786 U	< 2,170 U	390 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308195

DATA SUMMARY
SAMPLE COLLECTION DATE 04/15/93

SAMPLE ID :	A-C-AE-60-1	A-C-AE-60-2	A-C-AE-60-3	A-N-AE-60-1	A-N-AE-60-2	A-N-AE-60-3	A-NI-AE-60-1	A-NI-AE-60-2	A-NI-AE-60-3
LAB # :	04163-09	04163-10	04163-11	04163-01	04163-02	04163-03	04163-05	04163-06	04163-07
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	< 514 U	< 565 U	< 544 U	< 476 U	< 403 U	< 501 U	< 323 U	< 206 U	< 488 U
TOLUENE	< 514 U	< 565 U	< 544 U	< 476 U	< 403 U	< 501 U	< 323 U	< 206 U	< 488 U
ETHYLBENZENE	< 514 U	< 565 U	< 544 U	< 476 U	< 403 U	< 501 U	< 323 U	< 206 U	< 488 U
CHLOROBENZENE	< 771 U	< 847 U	< 816 U	19 U	15 U	< 751 U	< 485 U	10 U	32 U
1,4-DICHLOROBENZENE	< 771 U	< 847 U	< 816 U	< 715 U	< 605 U	< 751 U	< 485 U	< 308 U	< 731 U
1,3-DICHLOROBENZENE	< 771 U	< 847 U	< 816 U	< 715 U	< 605 U	< 751 U	< 485 U	< 308 U	< 731 U
1,2-DICHLOROBENZENE	< 771 U	< 847 U	< 816 U	< 715 U	< 605 U	< 751 U	< 485 U	< 308 U	< 731 U
1,3,5-TCB	103 U	339 U	< 518 U	48 U	60 U	25 U	81 U	260 U	171 U
1,2,4-TCB	31,859	16,148	56,236	27,145	23,851	38,309	68,757	19,042	22,150
1,2,3-TCB	12,349	6,608	10,665	5,956	4,807	7,783	17,044	6,113	10,002
1,2,4,5-TeCB	6,213	1,130	10,643	5,376	6,018	8,708	17,084	3,219	3,812
1,2,3,4-TeCB	14,847	7,056	15,654	9,885	8,720	14,224	28,572	8,202	8,870
PENTACHLOROBENZENE	5,663	2,362	6,568	3,047	3,336	4,299	3,298	1,214	2,853
HEXACHLOROBENZENE	668 U	424 U	545 U	596	523 U	1,726	997	114 U	484 U
NITROBENZENE	< 2,568 U	< 2,824 U	31,841	< 2,383 U	< 2,011 U	< 2,518 U	< 1,620 U	< 1,039 U	< 2,436 U
MCNB	< 3,853 U	< 4,236 U	< 4,089 U	< 3,575 U	< 3,017 U	< 3,777 U	< 2,431 U	< 1,559 U	< 3,654 U

Analysis Codes: *< u = Compound was not detected at or above the reporting limit.*
u = detected concentration was below the minimum detection limit (MDL).

AR308196

DATA SUMMARY
SAMPLE COLLECTION DATE 02/23/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	A-C-AN-0-1 02243-01 SLURRY (ug/Kg)	A-C-AN-0-2 02243-02 SLURRY (ug/Kg)	A-C-AN-0-3 02243-03 SLURRY (ug/Kg)	A-N-AN-0-1 02243-05 SLURRY (ug/Kg)	A-N-AN-0-2 02243-06 SLURRY (ug/Kg)	A-N-AN-0-3 02243-07 SLURRY (ug/Kg)	A-NI-AN-0-1 02243-09 SLURRY (ug/Kg)	A-NI-AN-0-2 02243-10 SLURRY (ug/Kg)	A-NI-AN-0-3 02243-11 SLURRY (ug/Kg)
BENZENE	< 28,225 u	< 20,541 u	< 32,217 u	558 u	< 22,971 u	< 29,555 u	< 25,862 u	< 29,626 u	< 29,959 u
TOLUENE	< 28,225 u	< 20,541 u	< 32,217 u	855 u	409 u	< 29,555 u	< 25,862 u	< 29,626 u	< 29,959 u
ETHYLBENZENE	< 28,225 u	< 20,541 u	< 32,217 u	1,204 u	666 u	< 29,555 u	< 25,862 u	< 29,626 u	< 29,959 u
CHLOROBENZENE	19,021 u	13,027 u	20,301 u	16,161 u	14,791 u	< 44,332 u	16,049 u	19,112 u	19,339 u
1,4-DICHLOROBENZENE	970,125	539,770	888,216	829,094	705,187	583,768	446,509	713,177	577,084
1,3-DICHLOROBENZENE	63,655	< 30,676 u	< 48,326 u	58,416	< 34,457 u	< 44,332 u	< 38,792 u	< 44,439 u	< 44,939 u
1,2-DICHLOROBENZENE	257,777	152,580	247,729	227,990	183,707	156,804	125,481	183,444	156,073
1,3,5-TCB	4,092 u	2,589 u	1,572 u	6,728 u	3,592 u	5,601 u	3,516 u	5,897 u	3,046 u
1,2,4-TCB	1,263,922	770,297	684,632	1,782,852	1,208,912	1,512,074	1,076,507	1,550,214	961,673
1,2,3-TCB	398,116	229,618	243,767	587,208	352,967	492,165	319,873	458,780	278,661
1,2,4,5-TeCB	179,848	29,201	52,578	76,123	88,597	66,216	44,589	57,373	43,500
1,2,3,4-TeCB	261,556	113,346	214,705	300,941	181,460	255,574	166,405	218,436	155,081
PENTACHLOROBENZENE	44,903	11,446	11,048	49,157	31,113	31,649	29,396	37,292	23,943
HEXACHLOROBENZENE	1,200 u	328 u	137 u	1,350 u	739 u	897 u	793 u	973 u	546 u
NITROBENZENE	< 315 u	< 236 u	< 361 u	< 282 u	< 272 u	< 268 u	< 250 u	< 259 u	< 268 u
MCNB	< 472 u	< 353 u	< 542 u	< 423 u	< 408 u	< 402 u	< 375 u	< 388 u	< 402 u

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308197

DATA SUMMARY
SAMPLE COLLECTION DATE 03/05/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	A-C-AN-10-1 03063-01 SLURRY (ug/Kg)	A-C-AN-10-2 03063-02 SLURRY (ug/Kg)	A-C-AN-10-3 03063-03 SLURRY (ug/Kg)	A-N-AN-10-1 03063-05 SLURRY (ug/Kg)	A-N-AN-10-2 03063-06 SLURRY (ug/Kg)	A-N-AN-10-3 03063-07 SLURRY (ug/Kg)	A-NI-AN-10-1 03063-09 SLURRY (ug/Kg)	A-NI-AN-10-2 03063-10 SLURRY (ug/Kg)	A-NI-AN-10-3 03063-11 SLURRY (ug/Kg)
BENZENE	< 28,553 u	< 13,911 u	< 29,968 u	< 11,012 u	< 33,101 u	< 31,273 u	< 30,317 u	< 25,353 u	< 31,290 u
TOLUENE	< 28,553 u	< 13,911 u	< 29,968 u	< 11,012 u	< 33,101 u	< 31,273 u	< 30,317 u	< 25,353 u	< 31,290 u
ETHYLBENZENE	< 28,553 u	< 13,911 u	< 29,968 u	< 11,012 u	< 33,101 u	< 31,273 u	< 30,317 u	< 25,353 u	< 31,290 u
CHLOROBENZENE	4,783 u	3,013 u	5,499 u	2,703 u	6,802 u	8,650 u	7,231 u	4,267 u	5,543 u
1,4-DICHLOROBENZENE	308,937	422,229	419,748	319,382	488,349	341,283	784,660	903,181	606,680 u
1,3-DICHLOROBENZENE	< 42,829 u	< 20,866 u	< 44,952 u	< 16,518 u	< 49,651 u	< 46,909 u	< 45,475 u	< 38,029 u	< 46,935 u
1,2-DICHLOROBENZENE	80,500	107,784	106,445	71,468	117,779 u	71,969	194,260	224,006	139,043 u
1,3,5-TCB	37,901	662 u	5,670 u	3,410 u	5,071 u	4,771 u	369 u	2,852 u	5,755 u
1,2,4-TCB	518,297	196,450	1,689,107	1,080,172	1,503,151	1,445,012	108,115	39,214	1,818,457
1,2,3-TCB	176,262	69,515	569,394	363,195	441,447	428,615	33,317	11,684	553,119
1,2,4,5-TeCB	26,862	8,353	81,567	46,544	59,067	124,444	4,751	991 u	77,609
1,2,3,4-TeCB	102,594	30,780	310,289	181,351	213,085	214,000	18,088	3,607	282,111
PENTACHLOROBENZENE	19,324	3,479	115,881	22,362	124,699	26,705	32,922	696 u	33,544
HEXACHLOROBENZENE	12,760	34 u	3,151 u	511 u	2,796 u	587 u	1,066	3 u	755 u
NITROBENZENE	< 255 u	< 309 u	< 267 u	< 245 u	< 298 u	< 282 u	< 272 u	< 285 u	< 2,382 u
MCNB	< 383 u	< 463 u	< 400 u	< 367 u	< 447 u	< 423 u	< 408 u	< 427 u	< 434 u

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308198

DATA SUMMARY
SAMPLE COLLECTION DATE 03/25/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	A-C-AN-30-1 03253-14 SLURRY (ug/Kg)	A-C-AN-30-2 03253-15 SLURRY (ug/Kg)	A-C-AN-30-3 03253-16 SLURRY (ug/Kg)	A-N-AN-30-1 03253-06 SLURRY (ug/Kg)	A-N-AN-30-2 03253-07 SLURRY (ug/Kg)	A-N-AN-30-3 03253-08 SLURRY (ug/Kg)	A-NI-AN-30-1 03253-10 SLURRY (ug/Kg)	A-NI-AN-30-2 03253-11 SLURRY (ug/Kg)	A-NI-AN-30-3 03253-12 SLURRY (ug/Kg)
BENZENE	< 15,061 U	< 13,175 U	< 16,409 U	< 16,307 U	< 16,829 U	< 15,069 U	< 16,172 U	< 16,666 U	< 13,276 U
TOLUENE	< 15,061 U	< 13,175 U	< 16,409 U	< 16,307 U	< 16,829 U	< 15,069 U	< 16,172 U	< 16,666 U	< 13,276 U
ETHYLBENZENE	< 15,061 U	< 13,175 U	< 16,409 U	< 16,307 U	< 16,829 U	< 15,069 U	< 16,172 U	< 16,666 U	< 13,276 U
CHLOROBENZENE	3,417 U	2,892 U	3,582 U	3,621 U	3,674 U	3,194 U	3,646 U	3,582 U	3,046 U
1,4-DICHLOROBENZENE	451,989	398,577	482,162	635,553	472,813	346,115	268,519	509,826	287,583
1,3-DICHLOROBENZENE	< 22,592 U	< 19,763 U	< 24,613 U	< 24,461 U	< 25,243 U	< 22,603 U	< 33,675 U	< 24,999 U	< 19,913 U
1,2-DICHLOROBENZENE	137,136	124,476	140,100	181,451	120,311	98,449	87,764	127,042	86,068
1,3,5-TCB	4,673	4,153 U	4,537 U	6,383 U	6,109 U	3,852 U	3,482 U	5,865 U	3,650 U
1,2,4-TCB	1,319,789	1,286,887	1,348,344	2,072,315	1,920,031	1,180,018	1,074,579	1,865,316	1,090,843
1,2,3-TCB	409,784	402,642	402,963	618,835	577,391	352,824	311,497	555,041	363,628
1,2,4,5-TeCB	62,603	56,694	57,216	176,910	137,094	47,330	44,570	70,762	48,936
1,2,3,4-TeCB	220,652	211,999	212,197	299,516	281,925	174,070	152,475	262,299	187,487
PENTACHLOROBENZENE	38,110	40,124	39,892	45,886	45,822	36,392	38,678	50,743	32,395
HEXACHLOROBENZENE	633 U	922 U	1,388 U	346 U	1,029 U	787 U	488 U	< 8,835 U	759 U
NITROBENZENE	< 3,852 U	4,090 U	3,861 U	< 293 U	< 301 U	< 273 U	< 291 U	1,769 U	1,679 U
MCNB	< 404 U	< 349 U	< 437 U	< 440 U	< 452 U	< 409 U	< 437 U	< 452 U	< 360 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308199

DATA SUMMARY
SAMPLE COLLECTION DATE 04/23/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	A-C-AN-60-1 04233-09 SLURRY (ug/Kg)	A-C-AN-60-2 04233-10 SLURRY (ug/Kg)	A-C-AN-60-3 04233-11 SLURRY (ug/Kg)	A-N-AN-60-1 04233-01 SLURRY (ug/Kg)	A-N-AN-60-2 04233-02 SLURRY (ug/Kg)	A-N-AN-60-3 04233-03 SLURRY (ug/Kg)	A-NI-AN-60-1 04233-05 SLURRY (ug/Kg)	A-NI-AN-60-2 04233-06 SLURRY (ug/Kg)	A-NI-AN-60-3 04233-07 SLURRY (ug/Kg)
BENZENE	< 11,125 U	< 11,671 U	< 11,052 U	< 11,664 U	< 10,499 U	< 11,121 U	< 25,591 U	< 12,817 U	< 11,851 U
TOLUENE	< 11,125 U	< 11,671 U	< 11,052 U	< 11,664 U	< 10,499 U	< 11,121 U	< 25,591 U	< 12,817 U	< 11,851 U
ETHYLBENZENE	2,730 U	< 11,671 U	< 11,052 U	< 11,664 U	< 10,499 U	< 11,121 U	< 25,591 U	< 12,817 U	< 11,851 U
CHLOROBENZENE	< 16,688 U	< 17,507 U	< 16,578 U	< 17,496 U	< 15,748 U	< 16,681 U	< 38,386 U	< 19,226 U	< 17,777 U
1,4-DICHLOROBENZENE	267,038	385,322	336,987	317,095	328,632	427,125	340,662	355,658	318,840
1,3-DICHLOROBENZENE	< 16,688 U	< 17,507 U	< 16,578 U	< 17,496 U	< 15,748 U	< 16,681 U	< 38,386 U	< 19,226 U	< 17,777 U
1,2-DICHLOROBENZENE	56,236	85,773	62,851	75,173	77,864	100,802	87,348	99,424	74,773
1,3,5-TCB	4,064 U	2,214 U	3,046 U	1,856 U	1,680 U	2,295 U	432 U	3,130 U	2,796 U
1,2,4-TCB	1,242,627	592,539	875,655	619,431	595,439	781,026	152,116	1,014,817	842,873
1,2,3-TCB	370,514	181,028	273,755	195,004	184,835	242,188	44,898	312,376	281,749
1,2,4,5-TeCB	50,006	33,898	43,757	50,859	30,389	35,877	7,614	42,945	43,994
1,2,3,4-TeCB	186,733	115,925	172,044	116,054	111,367	67,741	11,964	168,561	176,346
PENTACHLOROBENZENE	36,651	15,071	805	19,497	21,473	24,198	2,648	17,973	16,356
HEXACHLOROBENZENE	1,459 U	658	2,212	798	1,036	966	< 485 U	498	543 U
NITROBENZENE	< 249 U	1,340 U	3,151	< 260 U	< 242 U	< 247 U	< 285 U	< 290 U	< 262 U
MCNB	< 373 U	< 388 U	< 366 U	< 390 U	< 363 U	< 37[illegible] U	427	457	< 394 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308200

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 7B

SUBSURFACE SOIL FLASK TESTS

DATA SUMMARY
SAMPLE COLLECTION DATE 03/16/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AE-0-1 03173-18 SLURRY (ug/Kg)	B-C-AE-0-2 03173-19 SLURRY (ug/Kg)	B-C-AE-0-3 03173-20 SLURRY (ug/Kg)	B-N-AE-0-1 03173-10 SLURRY (ug/Kg)	B-N-AE-0-2 03173-11 SLURRY (ug/Kg)	B-N-AE-0-3 03173-12 SLURRY (ug/Kg)	B-NI-AE-0-1 03173-14 SLURRY (ug/Kg)	B-NI-AE-0-2 03173-15 SLURRY (ug/Kg)	B-NI-AE-0-3 03173-16 SLURRY (ug/Kg)
BENZENE	< 6,349 U	< 8,421 U	< 882 U	< 9,973 U	< 6,678 U	< 373 U	< 11,784 U	< 892 U	< 204 U
TOLUENE	< 6,349 U	< 8,421 U	< 882 U	< 9,973 U	< 6,678 U	< 373 U	< 11,784 U	< 892 U	< 204 U
ETHYLBENZENE	< 6,349 U	< 8,421 U	< 882 U	< 9,973 U	< 6,678 U	< 373 U	< 11,784 U	< 892 U	< 204 U
CHLOROBENZENE	1,703 U	2,437 U	250 U	14,960 U	< 10,018 U	136 U	2,842 U	224 U	< 306 U
1,4-DICHLOROBENZENE	42,777	31,535	28,430	22,386	23,695	11,978	31,081	13,504	6,032
1,3-DICHLOROBENZENE	< 9,524 U	< 12,631 U	< 1,324 U	< 14,960 U	< 10,018 U	< 559 U	< 17,676 U	< 1,338 U	< 306 U
1,2-DICHLOROBENZENE	17,617	15,484	9,101	17,790	17,300	9,316	21,992	11,376	2,936
1,3,5-TCB	< 2,509 U	279 U	393 U	787 U	904 U	517 U	977 U	839 U	215 U
1,2,4-TCB	41,786	94,145	101,577	340,281	329,282	202,574	350,103	275,226	74,908
1,2,3-TCB	11,477	32,932	28,763	84,544	105,623	62,984	118,599	95,559	22,652
1,2,4,5-TeCB	3,440	6,168	8,662	19,347	14,461	10,900	18,754	18,076	4,596
1,2,3,4-TeCB	9,806	21,225	24,243	44,518	48,583	32,364	61,835	55,041	13,075
PENTACHLOROBENZENE	26,108	7,559	6,561	< 8,206 U	10,684 U	7,554	13,356	12,551	2,920
HEXACHLOROBENZENE	1,832	434 U	760 U	< 14,169 U	373 U	268 U	449 U	483 U	< 2,673 U
NITROBENZENE	595 U	1,546	858 U	738 U	< 503 U	< 438 U	< 869 U	< 859 U	< 634 U
MCNB	8,790	28,226	6,646 U	171 U	< 754 U	384 U	1,550	1,288 U	394 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308202

DATA SUMMARY
SAMPLE COLLECTION DATE 03/26/93

SAMPLE ID :	B-C-AE-10-1	B-C-AE-10-2	B-C-AE-10-3	B-N-AE-10-1	B-N-AE-10-2	B-N-AE-10-3	B-NI-AE-10-1	B-NI-AE-10-2	B-NI-AE-10-3
LAB # :	03263-09	03263-10	03263-11	03263-01	03263-02	03263-03	03263-05	03263-06	03263-07
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	6 U	27 U	9 U	5 U	< 241 U	12 U	13 U	12 U	6 U
TOLUENE	< 103 U	< 270 U	< 167 U	< 139 U	< 241 U	< 189 U	< 326 U	< 181 U	< 103 U
ETHYLBENZENE	< 103 U	< 270 U	< 167 U	< 139 U	< 241 U	< 189 U	< 326 U	< 181 U	< 103 U
CHLOROBENZENE	64 U	208 U	120 U	72 U	106 U	85 U	204 U	92 U	80 U
1,4-DICHLOROBENZENE	488	6,367	5,911	182 U	454	255 U	576	1,461	211
1,3-DICHLOROBENZENE	< 155 U	< 406 U	< 251 U	< 209 U	254 U	94 U	163 U	339	59 U
1,2-DICHLOROBENZENE	207	2,145	2,155	128 U	451	204 U	527	315	178
1,3,5-TCB	198 U	201 U	327 U	182 U	[illegible]	371 U	202 U	354 U	155 U
1,2,4-TCB	53,877	71,695	70,197	[illegible]	95,889	104,202	65,639	84,725	10,532
1,2,3-TCB	30,833	20,528	47,832	29,604	32,834	33,627	19,725	29,821	4,080
1,2,4,5-TeCB	24,720	9,045	21,452	8,187	23,628	17,363	13,642	9,522	1,353
1,2,3,4-TeCB	42,225	28,631	39,492	25,169	32,529	46,435	32,108	30,355	4,561
PENTACHLOROBENZENE	6,035	8,711	5,303	5,101	12,698	9,405	7,149	7,203	2,643
HEXACHLOROBENZENE	340 U	506 U	423 U	293 U	810	[illegible]	738 U	497 U	138
NITROBENZENE	< 517 U	< 1,360 U	< 835 U	< 707 U	< 1,217 U	< 962 U	< 1,627 U	< 907 U	< 518 U
MCNB	< 776 U	< 2,039 U	< 1,252 U	< 1,061 U	25,404 U	10,318 U	< 2,440 U	< 1,360 U	< 777 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308203

DATA SUMMARY
SAMPLE COLLECTION DATE 04/15/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AE-30-1 04153-09 SLURRY (ug/Kg)	B-C-AE-30-2 04153-10 SLURRY (ug/Kg)	B-C-AE-30-3 04153-11 SLURRY (ug/Kg)	B-N-AE-30-1 04153-01 SLURRY (ug/Kg)	B-N-AE-30-2 04153-02 SLURRY (ug/Kg)	B-N-AE-30-3 04153-03 SLURRY (ug/Kg)	B-NI-AE-30-1 04153-05 SLURRY (ug/Kg)	B-NI-AE-30-2 04153-06 SLURRY (ug/Kg)	B-NI-AE-30-3 04153-07 SLURRY (ug/Kg)
BENZENE	< 93 U	< 211 U	< 107 U	< 178 U	< 505 U	< 528 U	< 134 U	< 286 U	< 170 U
TOLUENE	< 93 U	< 211 U	< 107 U	< 178 U	17 U	< 528 U	< 134 U	< 286 U	< 170 U
ETHYLBENZENE	< 93 U	< 211 U	< 107 U	< 178 U	< 505 U	< 528 U	< 134 U	< 286 U	< 170 U
CHLOROBENZENE	7 U	23 U	9 U	< 267 U	< 758 U	24 U	< 202 U	< 429 U	< 255 U
1,4-DICHLOROBENZENE	35 U	143 U	55 U	31 U	< 758 U	84 U	28 U	119 U	24 U
1,3-DICHLOROBENZENE	< 140 U	66 U	< 160 U	< 267 U	< 758 U	< 793 U	25 U	112 U	< 255 U
1,2-DICHLOROBENZENE	19 U	68 U	< 160 U	< 267 U	< 758 U	< 793 U	< 202 U	< 429 U	< 255 U
1,3,5-TCB	5 U	32 U	5 U	90 U	255 U	< 595 U	27 U	14 U	< 80 U
1,2,4-TCB	8,810	7,747	3,251	81,035	80,365	88,985	20,178	37,975	4,680
1,2,3-TCB	1,921	1,589	986	16,189	21,323	18,143	5,427	5,569	1,079
1,2,4,5-TeCB	2,312	216	764	21,291	14,145	21,823	5,847	8,136	1,521
1,2,3,4-TeCB	3,804	3,056	1,264	30,579	25,729	36,153	11,758	11,696	2,102
PENTACHLOROBENZENE	859	653	323	5,298	6,480	8,688	943	1,869	1,196
HEXACHLOROBENZENE	135 U	340	44 U	403 U	1,197 U	1,022 U	107 U	685 U	164 U
NITROBENZENE	< 482 U	< 1,080 U	< 545 U	< 896 U	< 2,547 U	< 2,620 U	< 674 U	< 1,428 U	< 851 U
MCNB	< 722 U	< 1,620 U	< 818 U	< 1,344 U	< 3,820 U	< 3,930 U	< 1,011 U	< 2,142 U	< 1,276 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308204

DATA SUMMARY
SAMPLE COLLECTION DATE 05/14/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AE-60-1 05143-09 SLURRY (ug/Kg)	B-C-AE-60-2 05143-10 SLURRY (ug/Kg)	B-C-AE-60-3 05143-11 SLURRY (ug/Kg)	B-N-AE-60-1 05143-01 SLURRY (ug/Kg)	B-N-AE-60-2 05143-02 SLURRY (ug/Kg)	B-N-AE-60-3 05143-03 SLURRY (ug/Kg)	B-NI-AE-60-1 05143-05 SLURRY (ug/Kg)	B-NI-AE-60-2 05143-06 SLURRY (ug/Kg)	B-NI-AE-60-3 05143-07 SLURRY (ug/Kg)
BENZENE	8 U	13 U	12 U	1 U	6 U	2 U	3 U	3 U	< 334 U
TOLUENE	< 253 U	< 488 U	4 U	< 83 U	< 330 U	< 167 U	< 225 U	< 219 U	< 334 U
ETHYLBENZENE	3 U	< 488 U	4 U	< 83 U	< 330 U	< 167 U	< 225 U	< 219 U	< 334 U
CHLOROBENZENE	75 U	145 U	121 U	19 U	73 U	36 U	51 U	44 U	50 U
1,4-DICHLOROBENZENE	95 U	217 U	165 U	21 U	82 U	58 U	71 U	78 U	35 U
1,3-DICHLOROBENZENE	< 380 U	< 732 U	< 917 U	< 124 U	< 496 U	< 250 U	< 337 U	< 329 U	< 500 U
1,2-DICHLOROBENZENE	60 U	246 U	99 U	15 U	68 U	27 U	38 U	36 U	35 U
1,3,5-TCB	30 U	138 U	211 U	24 U	911 U	851 U	56 U	61 U	64 U
1,2,4-TCB	26,152	90,650	101,257	22,913	92,953	262,464	57,876	58,039	19,675
1,2,3-TCB	4,319	34,780	24,659	3,288	27,315	91,409	9,238	8,426	3,194
1,2,4,5-TeCB	3,869	29,514	14,614	4,090	14,125	23,106	9,084	8,700	2,651
1,2,3,4-TeCB	7,660	39,767	38,215	6,137	51,602	80,550	14,823	7,330	5,190
PENTACHLOROBENZENE	1,413	3,752	2,649	902	8,070	4,209	1,250	1,455	1,294
HEXACHLOROBENZENE	181 U	283 U	257 U	80 U	551 U	157 U	118 U	171 U	131 U
NITROBENZENE	< 1,266 U	< 2,428 U	< 2,110 U	< 414 U	< 1,674 U	< 847 U	< 1,132 U	< 1,108 U	< 1,663 U
MCNB	< 1,899 U	< 3,643 U	< 3,165 U	< 621 U	< 2,512 U	< 1,271 U	< 1,698 U	< 1,662 U	< 2,494 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308205

DATA SUMMARY
SAMPLE COLLECTION DATE 04/01/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AN-10-1 04013-14 SLURRY (ug/Kg)	B-C-AN-10-2 04013-15 SLURRY (ug/Kg)	B-C-AN-10-3 04013-16 SLURRY (ug/Kg)	B-N-AN-10-1 04013-06 SLURRY (ug/Kg)	B-N-AN-10-2 04013-07 SLURRY (ug/Kg)	B-N-AN-10-3 04013-08 SLURRY (ug/Kg)	B-NI-AN-10-1 04013-10 SLURRY (ug/Kg)	B-NI-AN-10-2 04013-11 SLURRY (ug/Kg)	B-NI-AN-10-3 04013-12 SLURRY (ug/Kg)
BENZENE	390 U	369 U	1,886 U	< 7,855 U	130 U	188 U	418 U	389 U	246 U
TOLUENE	< 6,098 U	< 6,018 U	2,037 U	< 7,855 U	< 5,174 U	< 5,372 U	< 5,418 U	< 6,016 U	< 6,098 U
ETHYLBENZENE	< 6,098 U	< 6,018 U	1,795 U	< 7,855 U	< 5,174 U	< 5,372 U	< 5,418 U	< 6,016 U	< 6,098 U
CHLOROBENZENE	808 U	681 U	3,492 U	915 U	550 U	520 U	685 U	754 U	625 U
1,4-DICHLOROBENZENE	62,750	68,099	259,698	76,455	44,643	34,569	30,039	26,742	31,547
1,3-DICHLOROBENZENE	< 9,147 U	< 9,027 U	< 13,657 U	< 11,782 U	< 7,761 U	< 8,058 U	8,128 U	< 9,024 U	< 9,147 U
1,2-DICHLOROBENZENE	20,626	22,364	86,495	20,611	6,798 U	6,943 U	8,834	8,312 U	8,472 U
1,3,5-TCB	937 U	5,171	< 2,293 U	716 U	629 U	520 U	830 U	905 U	752 U
1,2,4-TCB	311,594	228,723	703,285	275,757 U	208,252	171,929	309,049	302,668	241,117
1,2,3-TCB	106,415	74,910	247,810	80,227	67,963	56,975	119,771	101,779	89,597
1,2,4,5-TeCB	18,237	11,305	39,606	12,357	9,923	8,376	14,628	19,916	11,866
1,2,3,4-TeCB	61,904	38,784	125,012	29,880	31,576	26,694	50,894	50,106	41,555
PENTACHLOROBENZENE	803 U	7,460	19,719 U	5,833	4,450	4,162	10,815	9,947	8,201
HEXACHLOROBENZENE	< 1,018 U	233 U	629 U	305 U	114 U	88 U	338 U	307 U	286 U
NITROBENZENE	< 406 U	< 403 U	< 405 U	< 524 U	< 346 U	< 357 U	< 361 U	< 402 U	< 413 U
MCNB	< 610 U	< 604 U	< 607 U	< 785 U	< 519 U	< 536 U	< 542 U	3,490 U	< 619 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308206

DATA SUMMARY
SAMPLE COLLECTION DATE 04/21/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AN-30-1 04213-09 SLURRY (ug/Kg)	B-C-AN-30-2 04213-10 SLURRY (ug/Kg)	B-C-AN-30-3 04213-11 SLURRY (ug/Kg)	B-N-AN-30-1 04213-01 SLURRY (ug/Kg)	B-N-AN-30-2 04213-02 SLURRY (ug/Kg)	B-N-AN-30-3 04213-03 SLURRY (ug/Kg)	B-NI-AN-30-1 04213-05 SLURRY (ug/Kg)	B-NI-AN-30-2 04213-06 SLURRY (ug/Kg)	B-NI-AN-30-3 04213-07 SLURRY (ug/Kg)
BENZENE	< 7,294 U	< 3,586 U	< 3,509 U	< 3,869 U	< 3,227 U	< 3,125 U	< 2,778 U	< 3,844 U	< 3,148 U
TOLUENE	< 7,294 U	< 3,586 U	< 3,509 U	< 3,869 U	< 3,227 U	< 3,125 U	< 2,778 U	< 3,844 U	< 3,148 U
ETHYLBENZENE	< 7,294 U	< 3,586 U	< 3,509 U	< 3,869 U	< 3,227 U	< 3,125 U	< 2,778 U	< 3,844 U	< 3,148 U
CHLOROBENZENE	420 U	255 U	248 U	122 U	195 U	179 U	344 U	224 U	< 4,721 U
1,4-DICHLOROBENZENE	74,370	35,100	33,055	37,317	16,749	19,053	11,600	19,886	22,412
1,3-DICHLOROBENZENE	< 10,941 U	< 5,379 U	< 5,263 U	< 5,803 U	< 4,840 U	< 4,688 U	< 4,168 U	< 5,766 U	< 4,721 U
1,2-DICHLOROBENZENE	23,582	10,698	9,847	4,887 U	5,762	4,627 U	3,792 U	6,220	3,630
1,3,5-TCB	271 U	522 U	< 425 U	648 U	268 U	439 U	501 U	760 U	584 U
1,2,4-TCB	99,272	183,246	144,045	213,024	109,020	166,279	175,164	254,578	194,255
1,2,3-TCB	33,577	65,523	51,463	75,142	37,716	59,482	63,353	89,017	70,335
1,2,4,5-TeCB	6,800	10,210	7,841	10,457	4,975	8,187	9,103	11,807	9,660
1,2,3,4-TeCB	19,315	35,771	28,888	33,406	17,043	28,929	33,911	44,061	30,746
PENTACHLOROBENZENE	6,570	4,373	3,459	3,469	3,791	4,090	4,363	7,554	4,475
HEXACHLOROBENZENE	537	191	163 U	180	238	219	246	782	221
NITROBENZENE	< 501 U	< 242 U	< 237 U	< 259 U	< 215 U	< 210 U	< 192 U	< 260 U	< 214 U
MCNB	519 U	< 363 U	< 356 U	< 389 U	< 322 U	< 315 U	< 288 U	< 391 U	< 321 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308207

DATA SUMMARY
SAMPLE COLLECTION DATE 05/21/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-AN-60-1 05213-09 SLURRY (ug/Kg)	B-C-AN-60-2 05213-10 SLURRY (ug/Kg)	B-C-AN-60-3 05213-11 SLURRY (ug/Kg)	B-N-AN-60-1 05213-01 SLURRY (ug/Kg)	B-N-AN-60-2 05213-02 SLURRY (ug/Kg)	B-N-AN-60-3 05213-03 SLURRY (ug/Kg)	B-NI-AN-60-1 05213-05 SLURRY (ug/Kg)	B-NI-AN-60-2 05213-06 SLURRY (ug/Kg)	B-NI-AN-60-3 05213-07 SLURRY (ug/Kg)
BENZENE	< 3,622 U	< 3,949 U	< 3,559 U	< 5,553 U	< 6,478 U	< 6,455 U	< 4,272 U	< 3,342 U	< 3,125 U
TOLUENE	< 3,622 U	< 3,949 U	< 3,559 U	< 5,553 U	< 6,478 U	< 6,455 U	< 4,272 U	< 3,342 U	< 3,125 U
ETHYLBENZENE	36 U	< 3,949 U	205 U	390 U	524 U	343 U	17 U	< 3,342 U	< 3,125 U
CHLOROBENZENE	526 U	305 U	359 U	1,320 U	990 U	713 U	679 U	619 U	504 U
1,4-DICHLOROBENZENE	36,780	39,872	48,262	74,173	51,351	48,575	46,763	38,168	32,240
1,3-DICHLOROBENZENE	< 5,433 U	< 5,924 U	< 5,339 U	< 8,330 U	< 9,717 U	< 9,682 U	< 6,408 U	< 5,013 U	< 4,687 U
1,2-DICHLOROBENZENE	10,439	10,410	13,154	23,348	12,217	13,272	12,431	7,139	7,830
1,3,5-TCB	1,511 U	1,082 U	1,478 U	2,786 U	2,555 U	1,377 U	1,284 U	1,009 U	565 U
1,2,4-TCB	582,256	381,154	517,185	935,731	914,730	494,217	455,940	277,985	194,737
1,2,3-TCB	187,591	127,734	168,590	297,202	304,186	152,335	157,807	95,647	66,671
1,2,4,5-TeCB	25,038	17,591	23,469	19,265	35,512	18,358	18,849	12,435	8,384
1,2,3,4-TeCB	74,501	57,591	75,758	57,623	118,041	58,383	62,192	42,611	28,327
PENTACHLOROBENZENE	7,754	1,275	4,425	11,353	11,552	5,116	7,436	5,511	4,160
HEXACHLOROBENZENE	389	50 U	236	659	582	235 U	519	273	212 U
NITROBENZENE	< 241 U	< 264 U	< 236 U	< 371 U	< 432 U	< 448 U	< 295 U	< 229 U	< 210 U
MCNB	< 362 U	< 396 U	< 353 U	< 557 U	< 648 U	< 637 U	< 442 U	< 343 U	< 315 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308208

DATA SUMMARY
SAMPLE COLLECTION DATE 03/22/93

SAMPLE ID :	B-C-AN-0-1	B-C-AN-0-2	B-C-AN-0-3	B-N-AN-0-1	B-N-AN-0-2	B-N-AN-0-3	B-NI-AN-0-1	B-NI-AN-0-2	B-NI-AN-0-3
LAB # :	03223-09	03223-10	03223-11	03223-01	03223-02	03223-03	03223-05	03223-06	03223-07
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	< 6,716 U	< 4,157 U	1,576 U	1,139 U	< 6,732 U	< 7,743 U	348 U	272 U	328 U
TOLUENE	145 U	99 U	447 U	346 U	190 U	184 U	180 U	< 6,142 U	< 5,918 U
ETHYLBENZENE	223 U	113 U	1,012 U	473 U	203 U	230 U	301 U	945 U	< 5,918 U
CHLOROBENZENE	2,384 U	1,624 U	4,066 U	2,361 U	2,709 U	3,228 U	2,826 U	2,811 U	2,606 U
1,4-DICHLOROBENZENE	53,860	22,097	52,355	31,592	39,940	55,394	25,865	26,269	27,627
1,3-DICHLOROBENZENE	< 10,074 U	< 6,236 U	< 13,253 U	< 8,665 U	< 10,098 U	< 11,615 U	< 8,903 U	< 9,213 U	< 8,877 U
1,2-DICHLOROBENZENE	21,375	10,002	23,118	15,220	18,820	23,628	13,105	13,417	15,127
1,3,5-TCB	6,525	538 U	696 U	513 U	303 U	640 U	514 U	382 U	302 U
1,2,4-TCB	263,065	182,228	273,224	198,333	132,749	262,125	211,393	145,910	122,392
1,2,3-TCB	96,125	58,368 U	95,463	62,618	40,877	83,009	67,194	49,822	38,124
1,2,4,5-TeCB	13,726	16,213	13,518	8,577	5,742	11,147	8,513	7,111	6,192
1,2,3,4-TeCB	48,351	28,085	45,883	27,329	18,048	36,073	27,227	24,888	17,339
PENTACHLOROBENZENE	7,856	5,667	7,387	3,863	2,590	5,921	6,798	1,513	39,268
HEXACHLOROBENZENE	186 U	111 U	< 2,043 U	< 2,556 U	< 2,471 U	< 3,792 U	217 U	54 U	1,648 U
NITROBENZENE	< 301 U	< 185 U	< 392 U	< 265 U	< 300 U	< 342 U	< 264 U	< 274 U	< 269 U
MCNB	< 451 U	< 278 U	< 588 U	< 398 U	< 449 U	< 514 U	2,280	< 411 U	< 404 U

Analysis codes: < U = compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308209

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 7C

SEDIMENT FLASK TESTS

DATA SUMMARY
SAMPLE COLLECTION DATE 03/01/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AE-0-1 03023-01 SLURRY (ug/Kg)	C-C-AE-0-2 03023-02 SLURRY (ug/Kg)	C-C-AE-0-3 03023-03 SLURRY (ug/Kg)	C-N-AE-0-1 03023-05 SLURRY (ug/Kg)	C-N-AE-0-2 03023-06 SLURRY (ug/Kg)	C-N-AE-0-3 03023-07 SLURRY (ug/Kg)	C-NI-AE-0-1 03023-09 SLURRY (ug/Kg)	C-NI-AE-0-2 03023-10 SLURRY (ug/Kg)	C-NI-AE-0-3 03023-11 SLURRY (ug/Kg)
BENZENE	11,595 u	10,038 u	12,093 u	458 u	630 u	858 u	1,023 u	802 u	765 u
TOLUENE	< 23,147 u	< 18,236 u	< 21,411 u	< 17,709 u	< 16,527 u	< 18,218 u	< 18,095 u	< 19,480 u	< 17,782 u
ETHYLBENZENE	< 23,147 u	< 18,236 u	< 21,411 u	< 17,709 u	< 16,527 u	< 18,218 u	< 18,095 u	< 19,480 u	< 17,782 u
CHLOROBENZENE	69,551	59,249	64,738	14,196 u	12,908 u	18,741 u	22,770 u	29,322	6,199 u
1,4-DICHLOROBENZENE	90,359	75,321	79,712	72,491	65,016	69,953	83,723	131,768	59,280
1,3-DICHLOROBENZENE	< 34,720 u	< 27,353 u	< 32,116 u	< 26,563 u	< 27,491 u	< 27,326 u	< 27,142 u	17,633 u	< 26,673 u
1,2-DICHLOROBENZENE	101,146	81,860	93,199	82,629	73,955	76,130	92,652	148,425	66,367
1,3,5-TCB	< 3,808 u	119 u	76 u	133 u	5 u	14 u	113 u	1,479 u	222
1,2,4-TCB	113,322	112,555	64,951	28,667	59,191	97,435	115,348	132,765	129,614
1,2,3-TCB	31,775	35,304	25,258	12,646	23,183	40,697	44,759	42,904	45,241
1,2,4,5-TeCB	11,283	13,031	5,980	3,333	5,937	8,862	12,505	15,709	20,586
1,2,3,4-TeCB	17,070	20,211	11,499	7,161	12,477	18,688	20,959	25,236	7,772
PENTACHLOROBENZENE	2,096 u	3,240	3,150	944	1,379	1,721	1,185	2,301	3,373
HEXACHLOROBENZENE	153 u	484 u	71 u	153 u	136 u	54 u	150 u	144 u	372
NITROBENZENE	< 1,530 u	< 1,293 u	< 1,498 u	< 1,220 u	< 1,139 u	< 1,305 u	< 1,244 u	< 1,341 u	5,357 u
MCNB	< 2,296 u	< 1,939 u	< 2,247 u	< 1,830 u	< 1,708 u	< 1,957 u	10,415	< 2,012 u	8,581 u

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308211

DATA SUMMARY
SAMPLE COLLECTION DATE 03/11/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AE-10-1 03113-01 SLURRY (ug/Kg)	C-C-AE-10-2 03113-02 SLURRY (ug/Kg)	C-C-AE-10-3 03113-03 SLURRY (ug/Kg)	C-N-AE-10-1 03113-05 SLURRY (ug/Kg)	C-N-AE-10-2 03113-06 SLURRY (ug/Kg)	C-N-AE-10-3 03113-07 SLURRY (ug/Kg)	C-NI-AE-10-1 03113-09 SLURRY (ug/Kg)	C-NI-AE-10-2 03113-10 SLURRY (ug/Kg)	C-NI-AE-10-3 03113-11 SLURRY (ug/Kg)
BENZENE	306 U	68 U	96 U	< 268 U	22 U	18 U	< 166 U	13 U	< 152 U
TOLUENE	< 973 U	< 230 U	< 260 U	< 268 U	< 201 U	< 164 U	< 166 U	< 125 U	< 152 U
ETHYLBENZENE	< 973 U	< 230 U	< 260 U	< 268 U	< 201 U	< 164 U	< 166 U	< 125 U	< 152 U
CHLOROBENZENE	1,412 U	352 U	410	257 U	219 U	113 U	70 U	151 U	64 U
1,4-DICHLOROBENZENE	2,900	489	818	425	278 U	233 U	338	211	238
1,3-DICHLOROBENZENE	< 1,459 U	< 345 U	< 390 U	< 403 U	< 301 U	< 245 U	< 250 U	187	< 228 U
1,2-DICHLOROBENZENE	2,074	313 U	560	347 U	58 U	< 245 U	125 U	88 U	0 U
1,3,5-TCB	499	5,792 U	688 U	174 U	156 U	758 U	384	1,159	939 U
1,2,4-TCB	400,461	97,129	96,768	193,754	42,965	39,871	34,104	27,886	27,220
1,2,3-TCB	71,261	19,567	20,224	27,157	11,145	10,690	9,290	7,112	4,660
1,2,4,5-TeCB	107,934	17,325	15,017	20,305	7,402	6,675	6,806	5,169	4,750
1,2,3,4-TeCB	80,928	24,709	22,913	31,550	13,248	10,722	12,701	7,433	6,779
PENTACHLOROBENZENE	7,017	2,893	2,835	2,784	4,962	3,884	1,481	1,515	899
HEXACHLOROBENZENE	1,696	386	4 U	378	252	63	214	135	158
NITROBENZENE	< 4,951 U	< 1,157 U	< 1,376 U	< 1,338 U	1,927	1,189	1,867	2,108	2,125
MCNB	< 7,426 U	< 1,736 U	< 2,064 U	< 2,007 U	3,218	195 U	2,180	2,348	1,770

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308212

DATA SUMMARY
SAMPLE COLLECTION DATE 03/31/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AE-30-1 03313-09 SLURRY (ug/Kg)	C-C-AE-30-2 03313-10 SLURRY (ug/Kg)	C-C-AE-30-3 03313-11 SLURRY (ug/Kg)	C-N-AE-30-1 03313-01 SLURRY (ug/Kg)	C-N-AE-30-2 03313-02 SLURRY (ug/Kg)	C-N-AE-30-3 03313-03 SLURRY (ug/Kg)	C-NI-AE-30-1 03313-05 SLURRY (ug/Kg)	C-NI-AE-30-2 03313-06 SLURRY (ug/Kg)	C-NI-AE-10-3 03313-07 SLURRY (ug/Kg)
BENZENE	23 U	30 U	27 U	< 188 U	5 U	7 U	< 189 U	4 U	< 227 U
TOLUENE	15 U	18 U	14 U	< 188 U	< 212 U	4 U	< 189 U	< 224 U	< 227 U
ETHYLBENZENE	< 192 U	< 253 U	< 215 U	< 188 U	< 212 U	< 164 U	< 189 U	< 224 U	< 227 U
CHLOROBENZENE	62 U	93 U	79 U	34 U	53 U	49 U	34 U	32 U	37 U
1,4-DICHLOROBENZENE	64 U	84 U	85 U	38 U	64	36 U	63 U	40 U	50
1,3-DICHLOROBENZENE	< 288 U	< 379 U	< 323 U	< 282 U	< 317 U	< 247 U	< 284 U	< 336 U	< 341 U
1,2-DICHLOROBENZENE	< 288 U	< 379 U	37 U	< 282 U	< 317 U	< 247 U	< 284 U	< 336 U	< 341 U
1,3,5-TCB	658 U	865 U	< 5,242 U	176 U	98 U	78 U	< 1,842 U	620 U	93 U
1,2,4-TCB	155,673	277,287	270,196	182,816	96,756	107,986	99,607	733,380	88,855
1,2,3-TCB	25,875	42,710	47,674	28,741	16,553	20,321	17,253	132,755	16,710
1,2,4,5-TeCB	29,298	54,083	27,130	38,328	19,270	18,103	30,047	183,000	18,463
1,2,3,4-TeCB	44,999	80,475	27,090	57,010	28,816	26,667	40,533	295,634	28,054
PENTACHLOROBENZENE	3,534	6,211	2,980 U	5,517	3,100	2,828	2,289	8,321	4,712
HEXACHLOROBENZENE	483 U	436 U	< 5,242 U	515 U	365 U	419 U	212 U	1,174	741
NITROBENZENE	3,273	3,856	1,489 U	5,110	3,724	3,173	2,127	8,581	4,780
MCNB	1,314	2,237	< 1,672 U	2,385	5,543	3,586	< 1,440 U	5,016	682 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308213

DATA SUMMARY
SAMPLE COLLECTION DATE 04/30/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AE-60-1 04303-09 SLURRY (ug/Kg)	C-C-AE-60-2 04303-10 SLURRY (ug/Kg)	C-C-AE-60-3 04303-11 SLURRY (ug/Kg)	C-N-AE-60-1 04303-01 SLURRY (ug/Kg)	C-N-AE-60-2 04303-02 SLURRY (ug/Kg)	C-N-AE-60-3 04303-03 SLURRY (ug/Kg)	C-NI-AE-60-1 04303-05 SLURRY (ug/Kg)	C-NI-AE-60-2 04303-06 SLURRY (ug/Kg)	C-NI-AE-60-3 04303-07 SLURRY (ug/Kg)
BENZENE	< 214 U	< 248 U	< 215 U	< 201 U	< 189 U	< 193 U	< 200 U	< 208 U	< 166 U
TOLUENE	< 214 U	< 248 U	< 215 U	< 201 U	< 189 U	< 193 U	< 200 U	< 208 U	< 166 U
ETHYLBENZENE	14 U	20 U	21 U	26 U	41 U	25 U	16 U	46 U	33 U
CHLOROBENZENE	461	1,068	833	1,647	230 U	916	1,614	208 U	753
1,4-DICHLOROBENZENE	69 U	178 U	106 U	163 U	48 U	116 U	197 U	60 U	95 U
1,3-DICHLOROBENZENE	270 U	505	272 U	474	59 U	411	803	85 U	302 U
1,2-DICHLOROBENZENE	184 U	413	224 U	462	69	264 U	557	91 U	200 U
1,3,5-TCB	139 U	528	472 U	328 U	97 U	99 U	207 U	297	77 U
1,2,4-TCB	19,052	24,085	29,399	33,232	12,164	18,089	20,542	29,659	17,915
1,2,3-TCB	4,960	6,813	9,150	13,265	3,256	4,673	6,720	8,574	4,760
1,2,4,5-TeCB	2,321	5,038	7,721	12,372	2,752	5,094	2,683	6,034	1,646
1,2,3,4-TeCB	3,883	4,566	5,300	13,471	5,473	4,670	5,149	7,572	3,338
PENTACHLOROBENZENE	934	628	908	3,537	772	597	654	873	389
HEXACHLOROBENZENE	116 U	173 U	276 U	802	231 U	399 U	118 U	247	70 U
NITROBENZENE	< 1,067 U	< 1,239 U	< 1,067 U	< 977 U	< 931 U	< 988 U	< 1,001 U	< 1,037 U	< 826 U
MCNB	< 1,600 U	3,102	< 1,601 U	< 1,466 U	< 1,397 U	< 1,482 U	< 1,502 U	3,261	< 1,238 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308214

DATA SUMMARY
SAMPLE COLLECTION DATE 03/08/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AN-0-1 03093-01 SLURRY (ug/Kg)	C-C-AN-0-2 03093-02 SLURRY (ug/Kg)	C-C-AN-0-3 03093-03 SLURRY (ug/Kg)	C-N-AN-0-1 03093-05 SLURRY (ug/Kg)	C-N-AN-0-2 03093-06 SLURRY (ug/Kg)	C-N-AN-0-3 03093-07 SLURRY (ug/Kg)	C-NI-AN-0-1 03093-09 SLURRY (ug/Kg)	C-NI-AN-0-2 03093-10 SLURRY (ug/Kg)	C-NI-AN-0-3 03093-11 SLURRY (ug/Kg)
BENZENE	1,485 U	2,405 U	5,814 U	8,713	9,848	7,753	4,044	7,735	3,563 U
TOLUENE	< 6,455 U	< 6,082 U	< 6,695 U	< 5,501 U	< 7,219 U	< 7,014 U	< 5,688 U	< 6,008 U	< 6,604 U
ETHYLBENZENE	< 6,455 U	< 6,082 U	< 6,695 U	< 5,501 U	< 7,219 U	< 7,014 U	< 5,688 U	< 6,008 U	< 6,604 U
CHLOROBENZENE	14,672	18,814	25,043	48,126	58,876	52,343	32,004	52,007	35,741
1,4-DICHLOROBENZENE	23,368	35,673	31,746	61,700	81,831	75,016	56,949	63,047	61,503
1,3-DICHLOROBENZENE	< 9,683 U	7,079 U	6,874 U	11,748	15,333	14,784	11,193	12,361	12,161
1,2-DICHLOROBENZENE	21,251	39,058	33,250	63,805	90,138	78,857	58,001	62,649	62,538
1,3,5-TCB	35 U	19 U	63 U	246 U	292 U	57 U	48 U	6 U	< 4,537 U
1,2,4-TCB	18,623	11,889	28,235	29,164	60,365	33,242	44,852	30,592	55,008
1,2,3-TCB	10,332	6,977	14,604	18,776	27,761	15,742	19,874	13,473	23,991
1,2,4,5-TeCB	1,736	1,896	3,795	2,550	11,985	4,565	4,491	3,108	9,704
1,2,3,4-TeCB	5,480	6,785	8,080	8,715	15,460	11,112	9,788	8,800	11,021
PENTACHLOROBENZENE	1,478	3,048	1,586	1,879	3,263	2,486	2,766	2,591	2,789 U
HEXACHLOROBENZENE	51 U	67 U	139	21 U	1,374	161 U	90 U	55 U	45 U
NITROBENZENE	< 434 U	< 412 U	< 448 U	< 1,444 U	1,708	1,512	< 381 U	< 408 U	< 453 U
MCNB	< 652 U	< 618 U	< 673 U	< 2,418 U	1,555	< 710 U	< 572 U	< 612 U	< 679 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308215

DATA SUMMARY
SAMPLE COLLECTION DATE 03/18/93

SAMPLE ID :	C-C-AN-10-1	C-C-AN-10-2	C-C-AN-10-3	C-N-AN-10-1	C-N-AN-10-2	C-N-AN-10-3	C-NI-AN-10-1	C-NI-AN-10-2	C-NI-AN-10-3
LAB # :	03183-21	03183-22	03183-23	03183-13	03183-14	03183-15	03183-17	03183-18	03183-19
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	5,456 U	3,440 U	3,100 U	3,712 U	3,575 U	3,060 U	1,912 U	1,514 U	1,705 U
TOLUENE	< 6,883 U	< 6,496 U	< 6,154 U	< 5,700 U	< 6,745 U	< 6,763 U	< 6,464 U	< 7,080 U	< 5,728 U
ETHYLBENZENE	< 6,883 U	< 6,496 U	< 6,154 U	< 5,700 U	< 6,745 U	< 6,763 U	< 6,464 U	< 7,080 U	< 5,728 U
CHLOROBENZENE	41,969	35,103	36,394	43,377	32,013	44,726	37,905	28,580	32,289
1,4-DICHLOROBENZENE	62,382	55,585	58,557	81,466	96,365	93,771	68,253	73,158	89,700
1,3-DICHLOROBENZENE	< 10,324 U	< 9,744 U	< 9,231 U	< 8,550 U	15,639	< 10,144 U	< 9,695 U	< 10,620 U	< 8,593 U
1,2-DICHLOROBENZENE	56,687	64,996	68,651	99,853	117,743	114,161	80,435	83,814	90,141
1,3,5-TCB	175 U	65 U	104 U	< 4,490 U	35 U	< 1,299 U	< 215 U	15 U	< 263 U
1,2,4-TCB	54,045	35,535	49,109	80,429	61,437	65,898	4,708	9,510	7,979
1,2,3-TCB	24,708	16,985	27,834	37,205	26,724	30,215	3,032	4,148	7,129
1,2,4,5-TeCB	5,522	2,628	4,394	44,990	6,036	5,898	279	2,380	2,283
1,2,3,4-TeCB	13,678	7,686	13,194	43,493	15,564	14,941	1,028	7,758	7,445
PENTACHLOROBENZENE	3,063	2,580	3,685	21,350	3,184 U	4,640	153 U	2,469	1,677
HEXACHLOROBENZENE	< 912 U	22 U	< 853 U	17,436	< 1,286 U	216 U	< 215 U	122 U	68 U
NITROBENZENE	79 U	1,444 U	1,543 U	< 380 U	2,392 U	3,114 U	992 U	< 474 U	1,484 U
MCNB	< 690 U	1,978 U	1,292 U	< 571 U	2,276 U	3,130 U	1,664 U	210 U	1,914 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308216

DATA SUMMARY
SAMPLE COLLECTION DATE 04/07/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	C-C-AN-30-1 04073-09 SLURRY (ug/Kg)	C-C-AN-30-2 04073-10 SLURRY (ug/Kg)	C-C-AN-30-3 04073-11 SLURRY (ug/Kg)	C-N-AN-30-1 04073-01 SLURRY (ug/Kg)	C-N-AN-30-2 04073-02 SLURRY (ug/Kg)	C-N-AN-30-3 04073-03 SLURRY (ug/Kg)	C-NI-AN-30-1 04073-05 SLURRY (ug/Kg)	C-NI-AN-30-2 04073-06 SLURRY (ug/Kg)	C-NI-AN-30-3 04073-07 SLURRY (ug/Kg)
BENZENE	9,049	6,235 U	4,738 U	9,388	6,260 U	4,515 U	476 U	1,509 U	1,165 U
TOLUENE	< 6,709 U	< 6,013 U	< 5,948 U	< 5,715 U	< 6,489 U	< 5,880 U	< 6,345 U	< 6,208 U	< 6,205 U
ETHYLBENZENE	< 6,709 U	< 6,013 U	< 5,948 U	< 5,715 U	< 6,489 U	< 5,880 U	< 6,345 U	< 6,208 U	< 6,205 U
CHLOROBENZENE	57,103	51,540	44,741	60,022	52,425	46,704	22,920	38,807	28,253
1,4-DICHLOROBENZENE	84,196	86,632	70,390	96,722	95,443	86,078	85,608	101,365	85,525
1,3-DICHLOROBENZENE	13,134	13,696	10,615	14,287	14,399	12,676	12,483	15,042	13,255
1,2-DICHLOROBENZENE	91,866	96,616	79,305	106,527	106,363	93,503	90,471	108,570	94,931
1,3,5-TCB	< 424 U	73 U	65 U	25 U	< 358 U	103 U	65 U	58 U	590 U
1,2,4-TCB	49,289	33,630	28,528	90,035	42,910	41,301	51,661	52,181	45,703
1,2,3-TCB	25,552	18,025	17,784	42,671	21,213	19,007	22,462	27,927	22,509
1,2,4,5-TeCB	4,746	6,337	2,248	6,163	3,430	3,575	4,067	4,377	2,958
1,2,3,4-TeCB	11,663	10,037	7,590	17,441	10,031	9,547	11,888	13,358	8,815
PENTACHLOROBENZENE	4,670	3,527	2,584	5,126	3,934	3,073	3,421	4,643	3,023
HEXACHLOROBENZENE	241 U	430	385	202 U	602	320 U	180 U	156 U	100 U
NITROBENZENE	1,704	5,668	6,413	< 392 U	< 433 U	< 393 U	< 424 U	< 434 U	< 413 U
MCNB	< 672 U	< 608 U	< 603 U	< 589 U	< 649 U	< 590 U	< 636 U	< 651 U	< 619 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308217

DATA SUMMARY
SAMPLE COLLECTION DATE 05/07/93

SAMPLE ID :	C-C-AN-60-1	C-C-AN-60-2	C-C-AN-60-3	C-N-AN-60-1	C-N-AN-60-2	C-N-AN-60-3	C-NI-AN-60-1	C-NI-AN-60-2	C-NI-AN-60-3
LAB # :	05073-09	05073-10	05073-11	05073-01	05073-02	05073-03	05073-05	05073-06	05073-07
MATRIX :	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY	SLURRY
CONCENTRATION :	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
BENZENE	3,353 U	3,027 U	3,948 U	4,278 U	4,074 U	4,529 U	525 U	909 U	2,795 U
TOLUENE	< 4,714 U	< 5,286 U	< 4,705 U	< 5,512 U	< 5,671 U	< 5,974 U	< 5,412 U	< 5,898 U	< 5,454 U
ETHYLBENZENE	473 U	491 U	< 4,705 U	< 5,512 U	< 5,671 U	< 5,974 U	< 5,412 U	< 5,898 U	< 5,454 U
CHLOROBENZENE	29,159	25,301	29,515	43,687	41,794	39,085	13,474	19,809	44,325
1,4-DICHLOROBENZENE	51,479	42,399	50,044	80,675	89,099	78,377	62,510	67,986	102,347
1,3-DICHLOROBENZENE	7,198	< 7,929 U	< 7,058 U	12,129	13,176	12,781	10,582	11,039	15,190
1,2-DICHLOROBENZENE	55,193	44,279	52,365	94,228	101,384	88,109	72,333	70,888	113,628
1,3,5-TCB	129 U	125 U	109 U	< 536 U	10 U	59 U	65 U	26 U	< 529 U
1,2,4-TCB	57,931	54,072	57,120	72,603	72,867	45,236	63,211	30,540	52,453
1,2,3-TCB	30,416	28,346	29,755	29,389	27,871	17,128	25,992	16,329	32,029
1,2,4,5-TeCB	4,093	5,039	4,908	10,765	11,996	7,857	11,743	2,947	3,373
1,2,3,4-TeCB	14,379	14,276	15,233	19,383	18,420	11,364	21,128	9,603	11,638
PENTACHLOROBENZENE	2,967	2,298	2,447	2,734	2,953	1,307	2,520	2,130	2,363
HEXACHLOROBENZENE	333	122 U	< 159 U	198	148 U	102 U	184	89 U	119 U
NITROBENZENE	< 317 U	< 354 U	< 315 U	< 370 U	< 384 U	< 402 U	< 367 U	< 402 U	< 366 U
MCNB	< 476 U	< 532 U	< 473 U	< 554 U	< 576 U	< 603 U	< 550 U	< 604 U	< 548 U

Analysis Codes: < u = Compound was not detected at or above the reporting limit.
u = detected concentration was below the minimum detection limit (MDL).

AR308218

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 7D

SOIL COLUMN TESTS

DATA SUMMARY
SAMPLE COLLECTION DATE 03/11/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-BC-CL-S-0-1 03113-13 SOIL (ug/kg)	B-BC-CL-S-0-2 03113-14 SOIL (ug/kg)	B-BC-CL-S-0-3 03113-15 SOIL (ug/kg)	B-BN-CL-S-0-1 03113-16 SOIL (ug/kg)	B-BN-CL-S-0-2 03113-17 SOIL (ug/kg)	B-BN-CL-S-0-3 03113-18 SOIL (ug/kg)
BENZENE	< 4,819 U	< 4,853 U	< 5,105 U	< 2,461 U	< 2,422 U	< 2,420 U
TOLUENE	< 4,819 U	< 4,853 U	< 5,105 U	< 2,461 U	< 2,422 U	< 2,420 U
ETHYLBENZENE	< 4,819 U	< 4,853 U	< 5,105 U	< 2,461 U	< 2,422 U	< 2,420 U
CHLOROBENZENE	2,258 U	1,604 U	1,973 U	1,206 U	1,034 U	1,070 U
1,4-DICHLOROBENZENE	109,640	112,579	125,318	48,358	47,341	55,699
1,3-DICHLOROBENZENE	< 7,228 U	< 7,279 U	< 7,658 U	< 3,691 U	< 3,633 U	< 3,630 U
1,2-DICHLOROBENZENE	30,814	32,389	35,915	15,526	16,234	19,252
1,3,5-TCB	584	444 U	536 U	206 U	1,265 U	1,080 U
1,2,4-TCB	241,321	185,084	229,262	111,874	390,320	354,199
1,2,3-TCB	89,333	71,890	87,839	46,623	135,684	123,447
1,2,4,5-TeCB	15,320	15,026	26,750	10,424	17,148	16,528
1,2,3,4-TeCB	49,157	44,932	53,921	39,257	57,598	55,437
PENTACHLOROBENZENE	7,961	8,289	9,712	8,404	17,090	12,863
HEXACHLOROBENZENE	256	102 U	288	228	564	384 U
NITROBENZENE	< 109 U	< 353 U	< 120 U	< 109 U	< 109 U	532 U
MCNB	< 83 U	< 100 U	< 179 U	< 164 U	< 163 U	109 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308220

DATA SUMMARY
SAMPLE COLLECTION DATE 03/12/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-CL-W-0-1 03173-01 WATER (ug/L)	B-C-CL-W-0-2 03173-02 WATER (ug/L)	B-C-CL-W-0-3 03173-03 WATER (ug/L)	B-BC-CL-W-0-1 03173-05 WATER (ug/L)	B-BC-CL-W-0-2 03173-06 WATER (ug/L)	B-BC-CL-W-0-3 03173-07 WATER (ug/L)	B-BC-CL-W-0-TB 03173-09 WATER (ug/L)
BENZENE	< 40 U	< 40 U	< 40 U	< 2 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 40 U	< 40 U	< 40 U	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	< 40 U	< 40 U	< 40 U	< 2 U	< 2 U	< 2 U	< 2 U
CHLOROBENZENE	148 U	107 U	119 U	6 U	6 U	6 U	6 U
1,4-DICHLOROBENZENE	6,727	7,318	10,236	22	18	13	15
1,3-DICHLOROBENZENE	< 60 U	< 60 U	< 60 U	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	2,943	3,918	6,489	< 3 U	< 3 U	< 3 U	< 3 U
1,3,5-TCB	17 U	16 U	15 U	< 5 U	0 U	< 5 U	
1,2,4-TCB	7,730	7,022	6,605	3 U	5 U	1 U	
1,2,3-TCB	2,718	2,477	2,318	< 1 U	1 U	0 U	
1,2,4,5-TeCB	45	42	42	< 0 U	0 U	0 U	
1,2,3,4-TeCB	130	131	123	< 0 U	1 U	0 U	
PENTACHLOROBENZENE	2 U	2 U	3 U	< 0 U	0 U	0 U	
HEXACHLOROBENZENE	< 5 U	< 5 U	< 5 U	< 0 U	0 U	0 U	
NITROBENZENE	< 10 U	10 U	< 10 U	< 10 U	< 10 U	< 10 U	
MCNB	4 U	3 U	1 U	15 U	15 U	1 U	

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308221

DATA SUMMARY
SAMPLE COLLECTION DATE 03/19/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-N-CL-W-0-1 03193-01 WATER (ug/L)	B-N-CL-W-0-2 03193-02 WATER (ug/L)	B-N-CL-W-0-3 03193-03 WATER (ug/L)	B-BN-CL-W-0-1 03193-05 WATER (ug/L)	B-BN-CL-W-0-2 03193-06 WATER (ug/L)	B-BN-CL-W-0-3 03193-07 WATER (ug/L)
BENZENE	< 40 U	< 40 U	< 40 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 40 U	< 40 U	< 40 U	19	20	18
ETHYLBENZENE	< 40 U	< 40 U	< 40 U	6	< 2 U	6
CHLOROBENZENE	73 U	107 U	78 U	3 U	4 U	4 U
1,4-DICHLOROBENZENE	12,397	11,407	10,786	< 3 U	< 3 U	< 3 U
1,3-DICHLOROBENZENE	< 60 U	< 60 U	< 60 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	4,106	3,840	3,584	< 3 U	< 3 U	< 3 U
1,3,5-TCB	10 U	11	11 U	< 5 U	< 5 U	< 5 U
1,2,4-TCB	4,822	5,613	5,557	5 U	3 U	4 U
1,2,3-TCB	1,674	1,884	1,909	1 U	0 U	1 U
1,2,4,5-TeCB	32	35	32	1 U	0 U	1 U
1,2,3,4-TeCB	102	92	107	1 U	0 U	1 U
PENTACHLOROBENZENE	3	0	2	0 U	0 U	0 U
HEXACHLOROBENZENE	< 5 U	0 U	< 5 U	0 U	0 U	0 U
NITROBENZENE	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
MCNB	0 U	15 U	< 15 U	15 U	< 15 U	< 15 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308222

DATA SUMMARY
SAMPLE COLLECTION DATE 03/19/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-CL-W-10-1 03193-09 WATER (ug/L)	B-C-CL-W-10-2 03193-10 WATER (ug/L)	B-C-CL-W-10-3 03193-11 WATER (ug/L)	B-C-CL-W-10-TB 03193-13 WATER (ug/L)
BENZENE	< 2 U	< 2 U	4 U	< 5 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 5 U
ETHYLBENZENE	< 2 U	< 2 U	< 2 U	< 5 U
CHLOROBENZENE	4 U	4 U	10	4 U
1,4-DICHLOROBENZENE	61	54	58	< 10 U
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 10 U
1,2-DICHLOROBENZENE	33	8 U	36	< 10 U
1,3,5-TCB	4 U	4 U	5 U	
1,2,4-TCB	1,303	1,155	1,493	
1,2,3-TCB	376	358 U	455	
1,2,4,5-TeCB	49	48	59	
1,2,3,4-TeCB	148	162	192	
PENTACHLOROBENZENE	8	8	9	
HEXACHLOROBENZENE	< 5 U	< 5 U	< 5 U	
NITROBENZENE	< 10 U	< 10 U	< 10 U	
MCNB	< 15 U	< 15 U	< 15 U	

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308223

DATA SUMMARY
SAMPLE COLLECTION DATE 03/24/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-N-CL-W-10-1 03253-01 WATER (ug/L)	B-N-CL-W-10-2 03253-02 WATER (ug/L)	B-N-CL-W-10-3 03253-03 WATER (ug/L)	B-N-CL-W-10-TB 03253-05 WATER (ug/L)
BENZENE	< 2 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	< 2 U	< 2 U	< 2 U	< 2 U
CHLOROBENZENE	6 U	6 U	6 U	5 U
1,4-DICHLOROBENZENE	200	190	210	9
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	65	63	67	4
1,3,5-TCB	3 U	6 U	4 U	
1,2,4-TCB	1,188	1,944	1,468	
1,2,3-TCB	343	596	429	
1,2,4,5-TeCB	34	56	43	
1,2,3,4-TeCB	102	181	128	
PENTACHLOROBENZENE	8	21	9	
HEXACHLOROBENZENE	< 5 U	< 5 U	< 5 U	
NITROBENZENE	< 10 U	< 10 U	< 10 U	
MCNB	< 15 U	< 15 U	4 U	

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308224

DATA SUMMARY
SAMPLE COLLECTION DATE 04/01/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-CL-W-30-1 04013-01 WATER (ug/L)	B-C-CL-W-30-2 04013-02 WATER (ug/L)	B-C-CL-W-30-3 04013-03 WATER (ug/L)	B-C-CL-W-30-TB 04013-05 WATER (ug/L)
BENZENE	< 1 U	< 2 U	1 U	1 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	< 2 U	< 2 U	< 2 U	< 2 U
CHLOROBENZENE	2 U	2 U	3	2 U
1,4-DICHLOROBENZENE	6	11	28	11
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	5	7	12	5
1,3,5-TCB	1 U	0 U	5 U	
1,2,4-TCB	151	139	384	
1,2,3-TCB	88	41	104	
1,2,4,5-TeCB	7	8	35	
1,2,3,4-TeCB	23	22	56	
PENTACHLOROBENZENE	4 U	4 U	15	
HEXACHLOROBENZENE	0 U	< 5 U	1 U	
NITROBENZENE	< 10 U	< 10 U	< 10 U	
MCNB	< 15 U	< 15 U	3 U	

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308225

DATA SUMMARY
SAMPLE COLLECTION DATE 04/09/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-N-CL-W-30-1 04093-01 WATER (ug/Kg)	B-N-CL-W-30-2 04093-02 WATER (ug/Kg)	B-N-CL-W-30-3 04093-03 WATER (ug/Kg)	B-N-CL-W-30-TB 04093-05 WATER (ug/Kg)
BENZENE	< 2 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	< 2 U	< 2 U	< 2 U	< 2 U
CHLOROBENZENE	3 U	2 U	2 U	3 U
1,4-DICHLOROBENZENE	22	21	13	5
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U
1,3,5-TCB	< 0	0 U	0 U	
1,2,4-TCB	10	156	102	
1,2,3-TCB	5 U	48	34	
1,2,4,5-TeCB	2 U	9 U	6	
1,2,3,4-TeCB	7	28	21	
PENTACHLOROBENZENE	1 U	0 U	3 U	
HEXACHLOROBENZENE	0 U	0 U	0 U	
NITROBENZENE	17	< 10 U	< 10 U	
MCNB	< 15 U	< 15 U	< 15 U	

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308226

DATA SUMMARY
SAMPLE COLLECTION DATE 04/22/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-BC-CL-W-60-1 04223-01 WATER (ug/L)	B-BC-CL-W-60-2 04223-02 WATER (ug/L)	B-BC-CL-W-60-3 04223-03 WATER (ug/L)	B-BC-CL-W-60-TB 04223-05 WATER (ug/L)	B-C-CL-W-60-1 04223-06 WATER (ug/L)	B-C-CL-W-60-2 04223-07 WATER (ug/L)	B-C-CL-W-60-3 04223-08 WATER (ug/L)
BENZENE	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
CHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	2 U	4 U	< 3 U	< 3 U	13	15	20
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
1,3,5-TCB	1 U	< 5 U	< 5 U		0 U	0 U	1 U
1,2,4-TCB	7	7	1 U		67	47	59
1,2,3-TCB	1 U	1 U	0 U		29	20	24
1,2,4,5-TeCB	1 U	1 U	0 U		3 U	3	3
1,2,3,4-TeCB	2 U	2 U	0 U		15	13	14
PENTACHLOROBENZENE	0 U	0 U	0 U		2 U	2 U	2
HEXACHLOROBENZENE	0 U	0 U	0 U		0 U	0 U	1
NITROBENZENE	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U
MCNB	< 15 U	< 15 U	< 15 U		< 15 U	< 15 U	< 15 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308227

DATA SUMMARY
SAMPLE COLLECTION DATE 04/22/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-C-CL-S-60-1 04223-10 SOIL (ug/Kg)	B-C-CL-S-60-2 04223-11 SOIL (ug/Kg)	B-C-CL-S-60-3 04213-12 SOIL (ug/Kg)
BENZENE	< 23 U	< 27 U	6 U
TOLUENE	< 23 U	< 27 U	6 U
ETHYLBENZENE	< 23 U	< 27 U	7 U
CHLOROBENZENE	< 34 U	4 U	10 U
1,4-DICHLOROBENZENE	140	61	101
1,3-DICHLOROBENZENE	< 34 U	40 U	36
1,2-DICHLOROBENZENE	14 U	32 U	35 U
1,3,5-TCB	156 U	100 U	206
1,2,4-TCB	42,537	27,365	7,529
1,2,3-TCB	12,911	8,281	1,793
1,2,4,5-TeCB	2,593	4,728	1,372
1,2,3,4-TeCB	7,138	17,021	4,349
PENTACHLOROBENZENE	2,564	1,296	1,131
HEXACHLOROBENZENE	119	119	125
NITROBENZENE	< 117 U	< 117 U	< 117 U
MCNB	< 175 U	< 176 U	< 176 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit
U = detected concentration was below the minimum detection limit

AR308228

DATA SUMMARY
SAMPLE COLLECTION DATE 04/22/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-BN-CL-W-60-1 05193-01 WATER (ug/L)	B-BN-CL-W-60-2 05193-02 WATER (ug/L)	B-BN-CL-W-60-3 05193-03 WATER (ug/L)	B-BN-CL-W-60-TB 05193-05 WATER (ug/L)	B-N-CL-W-60-1 05193-06 WATER (ug/L)	B-N-CL-W-60-2 05193-07 WATER (ug/L)	B-N-CL-W-60-3 05193-08 WATER (ug/L)
BENZENE	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
TOLUENE	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
ETHYLBENZENE	0 U	< 2 U	< 2 U	0 U	0 U	< 2 U	1 U
CHLOROBENZENE	3 U	3 U	3 U	7	2 U	2 U	2 U
1,4-DICHLOROBENZENE	4	4	3 U	9	13	12	15
1,3-DICHLOROBENZENE	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U	< 3 U
1,2-DICHLOROBENZENE	9	9	9	19	12	10	12
1,3,5-TCB	< 0 U	0 U	< 5 U		0 U	< 5 U	5 U
1,2,4-TCB	1 U	6	1 U		105	124	36
1,2,3-TCB	0 U	1 U	0 U		28	38	19
1,2,4,5-TeCB	0 U	1 U	0 U		7	9	6
1,2,3,4-TeCB	0 U	2 U	0 U		22	17	21
PENTACHLOROBENZENE	0 U	0 U	0 U		1 U	17	1 U
HEXACHLOROBENZENE	0 U	0 U	0 U		0 U	< 5 U	1 U
NITROBENZENE	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U
MCNB	< 15 U	< 15 U	< 15 U		< 15 U	< 15 U	< 15 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308229

DATA SUMMARY
SAMPLE COLLECTION DATE 04/22/93

SAMPLE ID : LAB # : MATRIX : CONCENTRATION :	B-N-CL-S-60-1 05193-10 SOIL (ug/Kg)	B-N-CL-S-60-2 05193-11 SOIL (ug/Kg)	B-N-CL-S-60-3 04213-12 SOIL (ug/Kg)
BENZENE	1 U	1 U	< 25 U
TOLUENE	< 25 U	< 24 U	< 25 U
ETHYLBENZENE	< 25 U	< 24 U	< 25 U
CHLOROBENZENE	4 U	4 U	3 U
1,4-DICHLOROBENZENE	8 U	8 U	4 U
1,3-DICHLOROBENZENE	6 U	10 U	< 37 U
1,2-DICHLOROBENZENE	17 U	15 U	12 U
1,3,5-TCB	< 108 U	63 U	59 U
1,2,4-TCB	15,623	12,096	2,796
1,2,3-TCB	4,751	3,531	1,405
1,2,4,5-TeCB	2,447	7,290	492
1,2,3,4-TeCB	8,123	7,803	1,747
PENTACHLOROBENZENE	1,756	2,761	306
HEXACHLOROBENZENE	116	224	59
NITROBENZENE	< 116 U	< 118 U	< 119 U
MCNB	< 174 U	< 177 U	< 178 U

Analysis Codes: < U = Compound was not detected at or above the reporting limit.
U = detected concentration was below the minimum detection limit (MDL).

AR308230

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 8

CHLORIDE AND NUTRIENT RESULTS

Standard Chlorine of Delaware
Chloride Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	87.6	34.9	57.4	30.8
	Nutrient	134	45.5	61.5	54.7
	Nutrient/Inoculated	127	58.2	80.7	54.4
Surface Soil-Anaerobic	Control	88.4	86.7	81.6	90.1
	Nutrient	94.5	92.2	133	172
	Nutrient/Inoculated	92.3	95.7	163	222
Subsurface Soil-Aerobic	Control	58.5	60.8	35.7	53.8
	Nutrient	68.0	79.3	54.4	119
	Nutrient/Inoculated	63.0	68.8	45.2	116
Subsurface Soil-Anaerobic	Control	203	270	182	184
	Nutrient	160	231	80.9	202
	Nutrient/Inoculated	186	247	227	264
Sediment-Aerobic	Control	48.8	140	64.6	48.8
	Nutrient	49.3	71.6	97.8	57.8
	Nutrient/Inoculated	48.7	131	66.1	52.1
Sediment-Anaerobic	Control	101	107	98.4	86.8
	Nutrient	99.4	112	112	108
	Nutrient/Inoculated	98.7	118	109	108

Standard Chlorine of Delaware
TKN Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	44.9	69.6	70.8	na
	Nutrient	58.8	58.2	69.3	na
	Nutrient/Inoculated	54.4	76.8	69.8	na
Surface Soil-Anaerobic	Control	138	61.7	180	na
	Nutrient	54.0	64.2	222	na
	Nutrient/Inoculated	34.1	63.3	160	na
Subsurface Soil-Aerobic	Control	22.5	49.6	345	na
	Nutrient	24.0	19.8	345	na
	Nutrient/Inoculated	20.0	17.5	362	na
Subsurface Soil-Anaerobic	Control	49.0	61.6	na	na
	Nutrient	64.8	48.8	na	na
	Nutrient/Inoculated	50.5	52.8	na	na
Sediment-Aerobic	Control	378	333	na	na
	Nutrient	315	243	na	na
	Nutrient/Inoculated	386	358	na	na
Sediment-Anaerobic	Control	258	197	441	na
	Nutrient	492	291	182	na
	Nutrient/Inoculated	330	426	398	na

na - Not analyzed

DRAFT

Standard Chlorine of Delaware
Ortho Phosphate Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	108	59.8	175	na
	Nutrient	118	108	242	na
	Nutrient/Inoculated	103	87.6	203	na
Surface Soil-Anaerobic	Control	6.6	7.9	14.9	na
	Nutrient	9.6	4.4	15.3	na
	Nutrient/Inoculated	10.3	4.1	10.1	na
Subsurface Soil-Aerobic	Control	130	186	79.9	na
	Nutrient	135	235	49.6	na
	Nutrient/Inoculated	133	212	68.6	na
Subsurface Soil-Anaerobic	Control	68.1	11.0	na	na
	Nutrient	66.8	27.7	na	na
	Nutrient/Inoculated	60.9	37.0	na	na
Sediment-Aerobic	Control	42.3	6.2	na	na
	Nutrient	48.5	3.1	na	na
	Nutrient/Inoculated	55.6	0.95	na	na
Sediment-Anaerobic	Control	0.43	0.29	0.12	na
	Nutrient	0.45	0.32	0.20	na
	Nutrient/Inoculated	0.52	0.30	0.17	na

na - Not analyzed.

Standard Chlorine of Delaware
Phosphate Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	137	143	373	na
	Nutrient	158	176	365	na
	Nutrient/Inoculated	166	171	339	na
Surface Soil-Anaerobic	Control	72.9	82.6	173	na
	Nutrient	85.3	78.2	190	na
	Nutrient/Inoculated	88.8	45.5	194	na
Subsurface Soil-Aerobic	Control	25.0	64.3	90.5	na
	Nutrient	28.9	55.2	70.9	na
	Nutrient/Inoculated	28.2	63.0	98.8	na
Subsurface Soil-Anaerobic	Control	195	60.4	na	na
	Nutrient	204	63.5	na	na
	Nutrient/Inoculated	204	61.3	na	na
Sediment-Aerobic	Control	149	169	na	na
	Nutrient	162	169	na	na
	Nutrient/Inoculated	163	247	na	na
Sediment-Anaerobic	Control	167	213	12.4	na
	Nutrient	163	184	22.4	na
	Nutrient/Inoculated	182	163	14.2	na

na - Not analyzed

Standard Chlorine of Delaware
Nitrate/Nitrite Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	1.3	1 u	0.49	na
	Nutrient	1.4	1.2	0.71	na
	Nutrient/Inoculated	1.3	1.1	0.86	na
Surface Soil-Anaerobic	Control	4.5	4.9	4.1	na
	Nutrient	4.5	3.4	3.0	na
	Nutrient/Inoculated	6.0	2.8	2.9	na
Subsurface Soil-Aerobic	Control	1.5 u	0.43	2.6	na
	Nutrient	0.67	0.99	3.7	na
	Nutrient/Inoculated	0.26	1.7	4.2	na
Subsurface Soil-Anaerobic	Control	0.16	0.32	na	na
	Nutrient	0.28	0.23	na	na
	Nutrient/Inoculated	0.16	0.28	na	na
Sediment-Aerobic	Control	0.7	35.4	na	na
	Nutrient	0.47	0.47	na	na
	Nutrient/Inoculated	0.45	0.82	na	na
Sediment-Anaerobic	Control	0.6	0.65	0.66	na
	Nutrient	0.38	0.10 u	0.26	na
	Nutrient/Inoculated	0.44	0.10 u	0.21	na

na - Not analyzed.
u - Not detected at or below the reporting limit. Value indicated is the reporting limit.

Standard Chlorine of Delaware
Ammonia Data Summary (mg/L)

Test Description	Test Condition	Time (days)			
		0	10	30	60
Surface Soil-Aerobic	Control	5.0 u	5.0 u	5.0 u	na
	Nutrient	0.92	1.0 u	1.4	na
	Nutrient/Inoculated	0.80	1.0	2.5	na
Surface Soil-Anaerobic	Control	5.0 u	5.0 u	34.8	na
	Nutrient	2.5	4.0	78.8	na
	Nutrient/Inoculated	3.6	4.7	78.3	na
Subsurface Soil-Aerobic	Control	5.0 u	5.0 u	5.0 u	na
	Nutrient	5.2	3.6	8.7	na
	Nutrient/Inoculated	5.4	2.0	8.6	na
Subsurface Soil-Anaerobic	Control	8.1	9.0	na	na
	Nutrient	16.5	13.6	na	na
	Nutrient/Inoculated	12.1	14.0	na	na
Sediment-Aerobic	Control	5.0 u	5.0 u	na	na
	Nutrient	1.4	1.0 u	na	na
	Nutrient/Inoculated	1.6	1.0 u	na	na
Sediment-Anaerobic	Control	48.4	5.0 u	5.0 u	na
	Nutrient	6.2	4.2	10.5	na
	Nutrient/Inoculated	4.6	6.8	9.7	na

na - Not analyzed.
u - Not detected at or below the reporting limit. Value indicated is the reporting limit.

Standard Chlorine of Delaware
Control Column Study
Subsurface Soil

Parameter	Water Analyses					
	Background	Day 0	Day 10	Day 30	Day 60	
					60 Day	Background
Chloride, mg/L	17.8	53.8	22.7	28.9	18.2	17.2
Nitrate/Nitrate, mg/l	2.4	1.9	2.9	4.0	na	na
Ammonia, mg/l	0.10 u	0.10 u	0.10 u	0.10 u	na	na
TKN, mg/L	0.10 u	0.10 u	0.10 u	0.10 u	na	na
Ortho Phosphate, mg/L	0.048	0.020	0.034	0.052	na	na
Phosohate, mg/L	0.68	0.64	27.6	0.058	na	na

na - Not analyzed.
u - Not detected at or below the reporting limit. Value indicated is the reporting limit.

DRAFT

Standard Chlorine of Delaware
Nutrient Column Study
Subsurface Soil

Parameter	Water Analyses					
	Background	Day 0	Day 10	Day 30	Day 60	
					60 Day	Background
Chloride, mg/L	22.9	22.6	20.7	17.2	16.4	16.8
Nitrate/Nitrate, mg/l	1.3	1.2	0.22	0.35	na	na
Ammonia, mg/l	13.7	0.10 u	13.2	13.4	na	na
TKN, mg/L	13.3	0.10 u	13.4	13.7	na	na
Ortho Phosphate, mg/L	12.5	3.7	19.4	16.2	na	na
Phosohate, mg/L	20.4	8.2	16.0	12.[illegible]	na	na

na - Not analyzed.
u - Not detected at or below the reporting limit. Value indicated is the reporting limit.

DRAFT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 9

TABULAR RESULTS SUMMARIES

DATA MANAGEMENT FOR TREATABILITY STUDY RESULTS

Triplicate averages were determined by using half the detection limit of results reported as non-detected ("< U"), the reported value of a result detected below the method detection limit ("U").

DRAFT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 9A

SURFACE SOIL FLASK TESTS

DATA SUMMARY
SURFACE SOIL - CONTROL - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-C-AE			
BENZENE	10.73	0.005	0.034	0.271
TOLUENE	10.73	0.069	0.078	0.271
ETHYLBENZENE	10.73	0.069	0.070	0.271
CHLOROBENZENE	9.10	0.026	0.090	0.406
1,4-DICHLOROBENZENE	497.28	0.144	0.240	0.406
1,3-DICHLOROBENZENE	22.56	0.103	0.194	0.406
1,2-DICHLOROBENZENE	146.71	0.050	0.197	0.406
1,3,5-TCB	6.68	0.157	0.208	0.234
1,2,4-TCB	1987.77	22.19	41.89	34.75
1,2,3-TCB	602.79	7.69	8.22	9.87
1,2,4,5-TeCB	101.33	6.47	9.15	6.00
1,2,3,4-TeCB	373.46	15.12	13.67	12.52
PENTACHLOROBENZENE	57.35	5.17	2.59	4.86
HEXACHLOROBENZENE	2.47	0.98	0.43	0.55
NITROBENZENE	0.501	0.35	2.64	11.51
MCNB	0.751	0.518	1.684	2.030

DATA SUMMARY
SURFACE SOIL - CONTROL - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-C-AE			
Mono-	9.10	0.03	0.09	0.41
Di-	667	0.30	0.63	1.22
Tri-	2,597	30.04	50.33	44.86
Tetra-	475	21.59	22.82	18.51
Penta-	57.35	5.17	2.59	4.86
Hexa-	2.47	0.98	0.43	0.55
Total Chlorobenzenes	3,807	58.11	76.89	70.40
Total Chlorides, mg/L	87.6	34.9	57.4	30.8

DATA SUMMARY
SURFACE SOIL - NUTRIENT - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-N-AE			
BENZENE	0.194	0.028	0.111	0.230
TOLUENE	0.215	0.087	0.111	0.230
ETHYLBENZENE	7.62	0.087	0.171	0.230
CHLOROBENZENE	6.54	0.020	0.053	0.137
1,4-DICHLOROBENZENE	352.55	0.058	0.099	0.345
1,3-DICHLOROBENZENE	23.40	0.078	0.167	0.345
1,2-DICHLOROBENZENE	102.33	0.061	0.167	0.345
1,3,5-TCB	3.51	0.212	0.146	0.04
1,2,4-TCB	1127.50	22.90	21.18	29.77
1,2,3-TCB	359.90	15.28	4.12	6.18
1,2,4,5-TeCB	93.64	4.01	5.80	6.70
1,2,3,4-TeCB	294.57	12.87	7.21	10.94
PENTACHLOROBENZENE	29.79	4.52	2.00	3.56
HEXACHLOROBENZENE	0.888	0.745	0.874	0.95
NITROBENZENE	0.351	0.440	0.896	1.15
MCNB	0.527	0.661	0.803	1.73

DATA SUMMARY
SURFACE SOIL - NUTRIENT - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-N-AE			
Mono-	6.54	0.02	0.05	0.14
Di-	478	0.20	0.43	1.04
Tri-	1,491	38.89	25.44	35.99
Tetra-	388	16.88	13.01	17.64
Penta-	29.79	4.52	2.00	3.56
Hexa-	0.89	0.75	0.87	0.95
Total Chlorobenzenes	2,395	61.24	41.81	59.32
Total Chlorides, mg/L	134.0	45.5	61.5	54.7

DATA SUMMARY
SURFACE SOIL - NUTRIENT & INNOCULATED - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-N-AE			
BENZENE	0.224	0.027	0.130	0.170
TOLUENE	0.218	0.070	0.106	0.170
ETHYLBENZENE	6.52	0.070	0.232	0.170
CHLOROBENZENE	5.57	0.016	0.073	0.095
1,4-DICHLOROBENZENE	277.66	0.058	0.144	0.254
1,3-DICHLOROBENZENE	18.30	0.086	0.159	0.254
1,2-DICHLOROBENZENE	85.61	0.043	0.135	0.254
1,3,5-TCB	1.88	0.199	0.180	0.17
1,2,4-TCB	602.01	15.98	3.62	36.65
1,2,3-TCB	192.41	5.77	1.07	11.05
1,2,4,5-TeCB	41.17	3.24	1.63	8.04
1,2,3,4-TeCB	158.22	11.85	4.91	15.21
PENTACHLOROBENZENE	38.08	7.82	2.12	2.46
HEXACHLOROBENZENE	1.198	1.311	0.198	0.53
NITROBENZENE	0.295	0.355	0.519	0.85
MCNB	0.443	0.532	0.789	1.27

DATA SUMMARY
SURFACE SOIL - NUTRIENT & INOCULATED - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-NI-AE			
Mono-	5.57	0.02	0.07	0.09
Di-	382	0.19	0.44	0.76
Tri-	796	21.96	4.87	47.87
Tetra-	199	15.10	6.54	23.25
Penta-	38.08	7.82	2.12	2.46
Hexa-	1.20	1.31	0.20	0.53
Total Chlorobenzenes	1,422	46.38	14.24	74.97
Total Chlorides, mg/L	127.0	58.2	80.7	54.4

DATA SUMMARY
SURFACE SOIL - CONTROL - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-C-AN			
BENZENE	13.497	12.072	7.441	5.641
TOLUENE	13.497	12.072	7.441	5.641
ETHYLBENZENE	13.497	12.072	7.441	4.697
CHLOROBENZENE	17.450	4.432	3.297	8.462
1,4-DICHLOROBENZENE	799	384	444	330
1,3-DICHLOROBENZENE	34.385	18.108	11.161	8.462
1,2-DICHLOROBENZENE	219.362	98.243	133.904	68.287
1,3,5-TCB	2.751	14.744	4.454	3.108
1,2,4-TCB	906	801	1,318	904
1,2,3-TCB	290.500	271.724	405.130	275.099
1,2,4,5-TeCB	87.209	38.927	58.838	42.554
1,2,3,4-TeCB	196.536	147.888	214.949	158.234
PENTACHLOROBENZENE	22.466	46.228	39.375	17.509
HEXACHLOROBENZENE	0.565	5.315	0.981	1.443
NITROBENZENE	0.152	0.139	3.292	1.539
MCNB	0.228	0.208	0.198	0.188

DATA SUMMARY
SURFACE SOIL - CONTROL - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-C-AN			
Mono-	17.45	4.43	3.30	8.46
Di-	1,053	500	589	407
Tri-	1,200	1,088	1,728	1,182
Tetra-	284	187	274	201
Penta-	22.47	46.23	39.38	17.51
Hexa-	0.56	5.32	0.98	1.44
Total Chlorobenzenes	2,577	1,831	2,635	1,817
Total Chlorides, mg/L	88.4	86.7	81.6	90.1

DATA SUMMARY
SURFACE SOIL - NUTRIENT - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-N-AN			
BENZENE	8.940	12.564	8.034	5.547
TOLUENE	5.347	12.564	8.034	5.547
ETHYLBENZENE	5.549	12.564	8.034	5.547
CHLOROBENZENE	17.706	6.052	3.496	8.321
1,4-DICHLOROBENZENE	706	383	485	358
1,3-DICHLOROBENZENE	32.604	18.846	12.051	8.321
1,2-DICHLOROBENZENE	189.500	87.072	133.404	84.613
1,3,5-TCB	5.307	4.417	5.448	1.944
1,2,4-TCB	1,501	1,343	1,724	665
1,2,3-TCB	477.447	411.086	516.350	207.342
1,2,4,5-TeCB	76.979	76.685	120.445	39.042
1,2,3,4-TeCB	245.992	202.812	251.837	98.387
PENTACHLOROBENZENE	37.306	57.922	42.700	21.723
HEXACHLOROBENZENE	0.995	1.298	0.721	0.933
NITROBENZENE	0.137	0.138	0.145	0.125
MCNB	0.205	0.206	0.217	0.187

DATA SUMMARY
SURFACE SOIL - NUTRIENT - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-N-AN			
Mono-	17.71	6.05	3.50	8.32
Di-	928	489	630	451
Tri-	1,984	1,758	2,246	875
Tetra-	323	279	372	137
Penta-	37.31	57.92	42.70	21.72
Hexa-	1.00	1.30	0.72	0.93
Total Chlorobenzenes	3,291	2,592	3,295	1,494
Total Chlorides, mg/L	94.5	92.2	133	172

DATA SUMMARY
SURFACE SOIL - NUTRIENT & INNOCULATED - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-NI-AN			
BENZENE	14.241	14.493	7.686	8.377
TOLUENE	14.241	14.493	7.686	8.377
ETHYLBENZENE	14.241	14.493	7.686	8.377
CHLOROBENZENE	18.167	5.680	3.425	12.565
1,4-DICHLOROBENZENE	579	765	355	338
1,3-DICHLOROBENZENE	21.362	21.740	13.098	12.565
1,2-DICHLOROBENZENE	154.999	185.770	100.291	87.182
1,3,5-TCB	4.153	2.992	4.332	2.119
1,2,4-TCB	1.196	655	1,344	670
1,2,3-TCB	352.438	199.373	410.055	213.008
1,2,4,5-TeCB	48.488	27.784	54.756	31.518
1,2,3,4-TeCB	179.974	101.269	200.754	118.957
PENTACHLOROBENZENE	30.210	22.387	40.605	12.326
HEXACHLOROBENZENE	0.771	0.608	1.888	0.428
NITROBENZENE	0.130	0.490	1.198	0.140
MCNB	0.194	0.212	0.208	0.360

DATA SUMMARY
SURFACE SOIL - NUTRIENT & INNOCULATED - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	A-NI-AN			
Mono-	18.17	5.68	3.42	12.56
Di-	755	972	469	438
Tri-	1,553	858	1,758	885
Tetra-	228	129	256	150
Penta-	30.21	22.39	40.61	12.33
Hexa-	0.77	0.61	1.89	0.43
Total Chlorobenzenes	2,586	1,988	2,528	1,499
Total Chlorides, mg/L	92.3	95.7	163	222

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 9B

SUBSURFACE SOIL FLASK TESTS

DATA SUMMARY
SUB-SURFACE SOIL - CONTROL - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-C-AE			
BENZENE	2.609	0.014	0.069	0.011
TOLUENE	2.609	0.090	0.069	0.125
ETHYLBENZENE	2.609	0.090	0.069	0.084
CHLOROBENZENE	1.463	0.131	0.013	0.114
1,4-DICHLOROBENZENE	34.247	4.255	0.078	0.159
1,3-DICHLOROBENZENE	3.913	0.135	0.072	0.338
1,2-DICHLOROBENZENE	14.067	1.502	0.056	0.135
1,3,5-TCB	0.642	0.242	0.014	0.126
1,2,4-TCB	79.169	65.256	6.603	72.686
1,2,3-TCB	24.391	33.064	1.499	21.253
1,2,4,5-TeCB	6.090	18.406	1.097	15.999
1,2,3,4-TeCB	18.425	36.783	2.708	28.547
PENTACHLOROBENZENE	13.409	6.683	0.612	2.605
HEXACHLOROBENZENE	1.009	0.423	0.173	0.240
NITROBENZENE	1.000	0.452	0.351	0.967
MCNB	14.554	0.678	0.527	1.451

DATA SUMMARY
SUBSURFACE SOIL - CONTROL - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-C-AE			
Mono-	1.46	0.13	0.01	0.11
Di-	52.23	5.89	0.21	0.63
Tri-	104.20	98.56	8.12	94.07
Tetra-	24.51	55.19	3.81	44.55
Penta-	13.41	6.68	0.61	2.60
Hexa-	1.01	0.42	0.17	0.24
Total Chlorobenzenes	197	167	12.92	142
Total Chlorides, mg/L	58.5	60.8	35.7	53.8

DATA SUMMARY
SUB-SURFACE SOIL - NUTRIENT - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-N-AE			
BENZENE	2.837	0.046	0.202	0.003
TOLUENE	2.837	0.095	0.123	0.097
ETHYLBENZENE	2.837	0.095	0.202	0.097
CHLOROBENZENE	6.702	0.088	0.179	0.043
1,4-DICHLOROBENZENE	19.353	0.297	0.165	0.054
1,3-DICHLOROBENZENE	4.256	0.151	0.303	0.145
1,2-DICHLOROBENZENE	14.802	0.261	0.303	0.037
1,3,5-TCB	0.736	0.311	0.214	0.595
1,2,4-TCB	290.712	81.012	83.462	126.110
1,2,3-TCB	84.384	32.822	18.552	40.671
1,2,4,5-TeCB	14.903	16.393	19.086	13.774
1,2,3,4-TeCB	41.822	34.711	30.820	46.096
PENTACHLOROBENZENE	7.447	9.068	6.822	4.394
HEXACHLOROBENZENE	2.575	0.682	0.874	0.263
NITROBENZENE	0.403	0.481	1.011	0.489
MCNB	0.311	12.084	1.516	0.734

DATA SUMMARY
SUBSURFACE SOIL - NUTRIENT - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-N-AE			
Mono-	6.70	0.09	0.18	0.04
Di-	38.41	0.71	0.77	0.24
Tri-	376	113	102	167
Tetra-	56.72	51.10	49.91	59.87
Penta-	7.45	9.07	6.82	4.39
Hexa-	2.58	0.68	0.87	0.26
Total Chlorobenzenes	488	175	161	232
Total Chlorides, mg/L	68.0	79.3	54.4	119.0

DATA SUMMARY
SUB-SURFACE SOIL - NUTRIENT & INNOCULATED - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-NI-AE			
BENZENE	2.147	0.010	0.098	0.058
TOLUENE	2.147	0.102	0.098	0.130
ETHYLBENZENE	2.147	0.102	0.098	0.130
CHLOROBENZENE	1.073	0.125	0.148	0.048
1,4-DICHLOROBENZENE	16.872	0.749	0.057	0.061
1,3-DICHLOROBENZENE	3.220	0.187	0.088	0.194
1,2-DICHLOROBENZENE	12.101	0.340	0.148	0.036
1,3,5-TCB	0.677	0.237	0.027	0.060
1,2,4-TCB	233.412	53.632	20.944	45.197
1,2,3-TCB	78.937	17.875	4.025	6.953
1,2,4,5-TeCB	13.809	8.172	5.168	6.812
1,2,3,4-TeCB	43.317	22.341	8.519	9.114
PENTACHLOROBENZENE	9.609	5.665	1.336	1.333
HEXACHLOROBENZENE	0.756	0.458	0.319	0.140
NITROBENZENE	0.394	0.509	0.492	0.651
MCNB	1.077	0.763	0.738	0.976

DATA SUMMARY
SUBSURFACE SOIL - NUTRIENT & INOCULATED - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-NI-AE			
Mono-	1.07	0.13	0.15	0.05
Di-	32.19	1.28	0.29	0.29
Tri-	313	71.74	25.00	52.21
Tetra-	57.13	30.51	13.69	15.93
Penta-	9.61	5.67	1.34	1.33
Hexa-	0.76	0.46	0.32	0.14
Total Chlorobenzenes	414	110	40.78	69.95
Total Chlorides, mg/L	63.0	68.8	45.2	116.0

DATA SUMMARY
SUB-SURFACE SOIL - CONTROL - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-C-AN			
BENZENE	2.338	0.882	2.398	1.855
TOLUENE	0.230	2.698	2.398	1.855
ETHYLBENZENE	0.449	2.618	2.398	0.739
CHLOROBENZENE	2.691	1.660	0.308	0.397
1,4-DICHLOROBENZENE	42.771	130.182	47.508	41.638
1,3-DICHLOROBENZENE	4.927	5.305	3.597	2.783
1,2-DICHLOROBENZENE	18.165	43.162	14.709	11.334
1,3,5-TCB	2.586	2.418	0.335	1.357
1,2,4-TCB	239.506	414.534	142.188	493.532
1,2,3-TCB	83.319	143.045	50.188	161.305
1,2,4,5-TeCB	14.486	23.049	8.284	22.033
1,2,3,4-TeCB	40.773	75.233	27.991	69.283
PENTACHLOROBENZENE	6.970	4.327	4.801	4.485
HEXACHLOROBENZENE	0.440	0.457	0.297	0.225
NITROBENZENE	0.146	0.202	0.163	0.124
MCNB	0.220	0.304	0.293	0.185

DATA SUMMARY
SUBSURFACE SOIL - CONTROL - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-C-AN			
Mono-	2.69	1.66	0.31	0.40
Di-	65.86	179	65.81	55.76
Tri-	325	560	193	656
Tetra-	55.26	98.28	36.28	91.32
Penta-	6.97	9.33	4.80	4.48
Hexa-	0.44	0.46	0.30	0.23
Total Chlorobenzenes	457	848	300	808
Total Chlorides, mg/L	203	270	182	184

DATA SUMMARY
SUB-SURFACE SOIL - NUTRIENT - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-N-AN			
BENZENE	2.792	1.415	1.704	3.081
TOLUENE	0.240	3.067	1.704	3.081
ETHYLBENZENE	0.302	3.067	1.704	0.419
CHLOROBENZENE	2.766	0.662	0.165	1.008
1,4-DICHLOROBENZENE	42.309	51.889	24.373	58.033
1,3-DICHLOROBENZENE	5.063	4.600	2.555	4.622
1,2-DICHLOROBENZENE	19.223	11.451	5.092	16.279
1,3,5-TCB	0.485	0.622	0.452	2.239
1,2,4-TCB	197.736	218.646	162.774	781.559
1,2,3-TCB	62.168	68.388	57.447	251.241
1,2,4,5-TeCB	8.489	10.219	7.873	24.378
1,2,3,4-TeCB	27.150	29.383	26.459	78.016
PENTACHLOROBENZENE	4.125	4.815	3.783	9.340
HEXACHLOROBENZENE	1.470	0.169	0.212	0.492
NITROBENZENE	0.151	0.205	0.114	0.209
MCNB	0.227	0.307	0.171	0.307

DATA SUMMARY
SUBSURFACE SOIL - NUTRIENT - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-N-AN			
Mono-	2.77	0.66	0.17	1.01
Di-	66.59	67.94	32.02	78.93
Tri-	260	288	221	1,035
Tetra-	35.64	39.60	34.33	102
Penta-	4.12	4.82	3.78	9.34
Hexa-	1.47	0.17	0.21	0.49
Total Chlorobenzenes	371	401	291	1,227
Total Chlorides, mg/L	160	231	80.9	202

DATA SUMMARY
SUB-SURFACE SOIL - NUTRIENT & INOCULATED - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-NI-AN			
BENZENE	0.316	0.351	1.628	1.790
TOLUENE	2.070	2.922	1.628	1.790
ETHYLBENZENE	1.402	2.922	1.628	1.084
CHLOROBENZENE	2.748	0.688	0.976	0.601
1,4-DICHLOROBENZENE	26.587	29.443	17.966	39.057
1,3-DICHLOROBENZENE	4.499	5.738	2.443	2.685
1,2-DICHLOROBENZENE	13.883	8.539	4.547	9.133
1,3,5-TCB	0.399	0.829	0.615	0.953
1,2,4-TCB	159.898	284.278	207.999	309.554
1,2,3-TCB	51.713	103.716	74.235	106.708
1,2,4,5-TeCB	7.272	15.470	10.190	13.223
1,2,3,4-TeCB	23.151	47.518	36.239	44.377
PENTACHLOROBENZENE	15.860	9.654	5.464	5.702
HEXACHLOROBENZENE	0.640	0.310	0.416	0.335
NITROBENZENE	0.135	0.196	0.111	0.122
MCNB	0.896	1.357	0.167	0.183

DATA SUMMARY
SUBSURFACE SOIL - NUTRIENT & INOCULATED - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	B-NI-AN			
Mono-	2.75	0.69	0.98	0.60
Di-	44.97	43.72	24.96	50.88
Tri-	212	389	283	417
Tetra-	30.42	62.99	46.43	57.60
Penta-	15.86	9.65	5.46	5.70
Hexa-	0.64	0.31	0.42	0.33
Total Chlorobenzenes	307	506	361	532
Total Chlorides, mg/L	186	247	227	264

WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 9C

SEDIMENT FLASK TESTS

DATA SUMMARY
SEDIMENT - CONTROL - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-C-AE			
BENZENE	11.242	0.157	0.027	0.113
TOLUENE	10.466	0.244	0.016	0.113
ETHYLBENZENE	10.466	0.244	0.110	0.018
CHLOROBENZENE	64.513	0.725	0.078	0.787
1,4-DICHLOROBENZENE	81.797	1.402	0.078	0.118
1,3-DICHLOROBENZENE	15.698	0.366	0.165	0.349
1,2-DICHLOROBENZENE	92.068	0.982	0.124	0.274
1,3,5-TCB	0.700	2.326	1.381	0.380
1,2,4-TCB	96.943	198.119	234.385	24.179
1,2,3-TCB	30.779	37.017	38.753	6.974
1,2,4,5-TeCB	10.098	46.759	36.837	5.027
1,2,3,4-TeCB	16.260	42.850	50.855	4.583
PENTACHLOROBENZENE	2.829	4.248	4.242	0.823
HEXACHLOROBENZENE	0.236	0.695	1.180	0.188
NITROBENZENE	0.720	1.247	2.873	0.562
MCNB	1.080	1.871	1.462	1.568

DATA SUMMARY
SEDIMENT - CONTROL - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-C-AE			
Mono-	64.51	0.72	0.08	0.79
Di-	190	2.75	0.37	0.74
Tri-	128	237	275	31.53
Tetra-	26.36	89.61	87.69	9.61
Penta-	2.83	4.25	4.24	0.82
Hexa-	0.24	0.70	1.18	0.19
Total Chlorobenzenes	412	335	368	43.68
Total Chlorides, mg/L	48.8	140	64.6	48.8

DATA SUMMARY
SEDIMENT - NUTRIENT - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-N-AE			
BENZENE	0.649	0.058	0.035	0.097
TOLUENE	8.742	0.106	0.068	0.097
ETHYLBENZENE	8.742	0.106	0.094	0.031
CHLOROBENZENE	15.282	0.196	0.045	0.931
1,4-DICHLOROBENZENE	69.153	0.312	0.046	0.109
1,3-DICHLOROBENZENE	13.563	0.158	0.141	0.315
1,2-DICHLOROBENZENE	77.571	0.176	0.141	0.265
1,3,5-TCB	0.051	0.363	0.117	0.175
1,2,4-TCB	61.764	68.867	129.186	27.828
1,2,3-TCB	25.509	16.931	21.872	7.065
1,2,4,5-TeCB	6.044	11.461	25.234	6.739
1,2,3,4-TeCB	12.775	18.507	37.498	7.871
PENTACHLOROBENZENE	1.348	3.877	3.815	1.969
HEXACHLOROBENZENE	0.114	0.231	0.433	0.477
NITROBENZENE	0.611	1.262	4.002	0.483
MCNB	0.916	1.472	3.838	0.724

DATA SUMMARY
SEDIMENT - NUTRIENT - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-N-AE			
Mono-	15.28	0.20	0.05	0.93
Di-	160.29	0.65	0.33	0.69
Tri-	87.32	85.56	151	35.07
Tetra-	18.82	29.97	62.73	14.61
Penta-	1.35	3.88	3.82	1.97
Hexa-	0.11	0.23	0.43	0.48
Total Chlorobenzenes	283	120	219	53.74
Total Chlorides, mg/L	49.3	71.6	97.8	57.8

DATA SUMMARY
SEDIMENT - NUTRIENT & INOCULATED - AEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-NI-AE			
BENZENE	0.863	0.057	0.071	0.096
TOLUENE	9.226	0.074	0.107	0.096
ETHYLBENZENE	9.226	0.074	0.107	0.032
CHLOROBENZENE	19.430	0.095	0.034	0.858
1,4-DICHLOROBENZENE	91.590	0.262	0.051	0.117
1,3-DICHLOROBENZENE	14.847	0.142	0.160	0.397
1,2-DICHLOROBENZENE	102.481	0.071	0.160	0.283
1,3,5-TCB	0.605	0.827	0.545	0.194
1,2,4-TCB	125.909	29.737	307.281	22.705
1,2,3-TCB	44.301	7.021	55.573	6.685
1,2,4,5-TeCB	16.267	5.575	77.170	3.454
1,2,3,4-TeCB	17.989	8.971	121.407	5.353
PENTACHLOROBENZENE	2.286	1.298	5.107	0.639
HEXACHLOROBENZENE	0.222	0.169	0.709	0.145
NITROBENZENE	2.217	2.033	5.163	0.477
MCNB	6.667	2.099	2.139	1.544

DATA SUMMARY
SEDIMENT - NUTRIENT & INOCULATED - AEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-NI-AE			
Mono-	19.43	0.10	0.03	0.86
Di-	208.92	0.48	0.37	0.80
Tri-	171	37.58	363	29.58
Tetra-	34.26	14.55	199	8.81
Penta-	2.29	1.30	5.11	0.64
Hexa-	0.22	0.17	0.71	0.15
Total Chlorobenzenes	436	54.17	568	40.83
Total Chlorides, mg/L	48.7	131	66.1	52.1

DATA SUMMARY
SEDIMENT - CONTROL - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-C-AN			
BENZENE	3.235	3.999	6.674	3.443
TOLUENE	3.205	3.256	3.112	2.451
ETHYLBENZENE	3.205	3.256	3.112	1.106
CHLOROBENZENE	19.510	37.822	51.128	27.992
1,4-DICHLOROBENZENE	30.262	58.841	80.406	47.974
1,3-DICHLOROBENZENE	6.265	4.883	12.482	4.897
1,2-DICHLOROBENZENE	31.186	63.445	89.262	50.612
1,3,5-TCB	0.039	0.115	0.117	0.121
1,2,4-TCB	19.582	46.230	37.149	56.374
1,2,3-TCB	10.638	23.176	20.454	29.506
1,2,4,5-TeCB	2.476	4.181	4.444	4.680
1,2,3,4-TeCB	6.782	11.519	9.763	14.629
PENTACHLOROBENZENE	2.037	3.109	3.594	2.571
HEXACHLOROBENZENE	0.086	0.302	0.352	0.178
NITROBENZENE	0.216	1.022	4.595	0.164
MCNB	0.324	1.205	0.314	0.247

DATA SUMMARY
SEDIMENT - CONTROL - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-C-AN			
Mono-	19.51	37.82	51.13	27.99
Di-	67.71	127	182	103
Tri-	30.26	69.52	57.72	86.00
Tetra-	9.26	15.70	14.21	19.31
Penta-	2.04	3.11	3.59	2.57
Hexa-	0.09	0.30	0.35	0.18
Total Chlorobenzenes	129	254	309	240
Total Chlorides, mg/L	101	107	98.4	86.8

DATA SUMMARY
SEDIMENT - NUTRIENT - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-N-AN			
BENZENE	8.771	3.449	6.721	4.294
TOLUENE	3.289	3.201	3.014	2.860
ETHYLBENZENE	3.289	3.201	3.014	2.860
CHLOROBENZENE	53.115	40.039	53.050	41.522
1,4-DICHLOROBENZENE	72.849	90.534	92.748	82.717
1,3-DICHLOROBENZENE	13.955	8.329	13.787	12.695
1,2-DICHLOROBENZENE	77.600	110.586	102.131	94.574
1,3,5-TCB	0.198	0.983	0.102	0.112
1,2,4-TCB	40.924	69.255	58.082	63.569
1,2,3-TCB	20.760	31.381	27.630	24.796
1,2,4,5-TeCB	6.367	18.975	4.389	10.206
1,2,3,4-TeCB	11.762	24.666	12.340	16.389
PENTACHLOROBENZENE	2.543	9.725	4.044	2.331
HEXACHLOROBENZENE	0.519	6.098	0.375	0.149
NITROBENZENE	1.314	1.899	0.203	0.193
MCNB	1.040	1.897	0.305	0.289

DATA SUMMARY
SEDIMENT - NUTRIENT - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-N-AN			
Mono-	53.12	40.04	53.05	41.52
Di-	164	209	209	190
Tri-	61.88	101.62	85.81	88.48
Tetra-	18.13	43.64	16.73	26.60
Penta-	2.54	9.72	4.04	2.33
Hexa-	0.52	6.10	0.37	0.15
Total Chlorobenzenes	301	411	369	349
Total Chlorides, mg/L	99.4	112	112	108

DATA SUMMARY
SEDIMENT - NUTRIENT & INOCULATED - ANAEROBIC

TRIPLICATE AVERAGES
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-NI-AN			
BENZENE	5.114	1.710	1.050	1.410
TOLUENE	3.050	3.212	3.126	2.794
ETHYLBENZENE	3.050	3.212	3.126	2.794
CHLOROBENZENE	39.917	32.925	29.993	25.869
1,4-DICHLOROBENZENE	60.500	77.037	90.833	77.614
1,3-DICHLOROBENZENE	11.905	4.818	13.593	12.270
1,2-DICHLOROBENZENE	61.063	84.797	97.991	85.616
1,3,5-TCB	0.774	0.085	0.238	0.119
1,2,4-TCB	43.484	7.399	49.848	48.735
1,2,3-TCB	19.113	4.770	24.299	24.783
1,2,4,5-TeCB	5.768	1.647	3.801	6.021
1,2,3,4-TeCB	9.870	5.410	11.354	14.123
PENTACHLOROBENZENE	2.715	1.433	3.696	2.338
HEXACHLOROBENZENE	0.063	0.099	0.145	0.131
NITROBENZENE	0.207	0.904	0.212	0.189
MCNB	0.311	1.263	0.318	0.284

DATA SUMMARY
SEDIMENT - NUTRIENT & INOCULATED - ANAEROBIC

CHLOROBENZENE TOTALS
(parts per million)

Time (days)	0	10	30	60
Parameter (mg/kg)	C-NI-AN			
Mono-	39.92	32.92	29.99	25.87
Di-	133	167	202	176
Tri-	63.37	12.25	74.39	73.64
Tetra-	15.64	7.06	15.15	20.14
Penta-	2.72	1.43	3.70	2.34
Hexa-	0.06	0.10	0.15	0.13
Total Chlorobenzenes	255	220	326	298
Total Chlorides, mg/L	98.7	118	109	108

DATA SUMMARY
CONTROL COLUMN

TRIPLICATE AVERAGES
(parts per billion)

PARAMETER	AQUEOUS SAMPLES (ug/L)						SOIL SAMPLES (ug/Kg)	
	FEED		LEACHATE					
	Day 0	Day 60	Day 0	Day 10	Day 30	Day 60	Day 0	Day 60
BENZENE	1	1	20	2	1	1	2,463	10
TOLUENE	1	1	20	1	1	1	2,463	10
ETHYLBENZENE	1	1	20	1	1	1	2,463	11
CHLOROBENZENE	6	2	125	6	2	1	1,945	10
1,4-DICHLOROBENZENE	18	3	8,094	58	16	16	115,846	101
1,3-DICHLOROBENZENE	2	2	30	2	2	2	3,694	31
1,2-DICHLOROBENZENE	2	2	4,450	26	8	2	33,039	27
1,3,5-TCB	2	2	16	4	2	0	521	154
1,2,4-TCB	3	5	7,119	1,317	225	58	218,556	25,810
1,2,3-TCB	1	1	2,504	396	78	24	83,021	7,662
1,2,4,5-TeCB	0	1	43	52	17	3	19,032	2,898
1,2,3,4-TeCB	0	1	128	167	34	14	49,337	9,503
PENTACHLOROBENZENE	0	0	2	8	8	2	8,654	1,664
HEXACHLOROBENZENE	0	0	3	3	1	0	215	121
NITROBENZENE	5	5	7	5	5	5	97	59
MCNB	8	8	3	8	6	8	60	88

AR308263

DATA SUMMARY
CONTROL COLUMN

CHLOROBENZENE TOTALS
(parts per billion)

PARAMETER	AQUEOUS SAMPLES (ug/L)						SOIL SAMPLES (ug/Kg)	
	FEED		LEACHATE					
	Day 0	Day 60	Day 0	Day 10	Day 30	Day 60	Day 0	Day 60
Mono-	6	2	125	6	2	1	1,945	10
Di-	21	6	12,574	85	26	19	152,579	159
Tri-	5	8	9,639	1,718	304	82	302,098	33,626
Tetra-	0	2	171	219	50	17	68,369	12,400
Penta-	0	0	2	[illegible]	8	2	8,654	1,664
Hexa-	0	0	3	3	1	0	215	121
Total Chlorobenzenes	32	17	22,533	2,010	388	122	533,667	47,233

DRAFT

AR308264

WESTON
MANAGERS DESIGNERS CONSULTANTS

DRAFT

ATTACHMENT 9D

SOIL COLUMN TESTS

DATA SUMMARY
NUTRIENT COLUMN

TRIPLICATE AVERAGES
(parts per billion)

PARAMETER	AQUEOUS SAMPLES (ug/L)						SOIL SAMPLES (ug/Kg)	
	FEED		LEACHATE					
	Day 0	Day 60	Day 0	Day 10	Day 30	Day 60	Day 0	Day 60
BENZENE	1	1	20	1	1	1	1,217	5
TOLUENE	19	1	20	1	1	1	1,217	12
ETHYLBENZENE	4	1	20	1	1	1	1,217	12
CHLOROBENZENE	4	3	86	6	2	2	1,103	4
1,4-DICHLOROBENZENE	2	4	11,530	200	19	13	50,466	7
1,3-DICHLOROBENZENE	2	2	30	2	2	2	1,826	12
1,2-DICHLOROBENZENE	2	9	3,843	65	2	11	17,004	15
1,3,5-TCB	3	1	11	4	0	3	850	59
1,2,4-TCB	4	3	5,331	1,533	89	88	285,464	10,172
1,2,3-TCB	1	0	1,822	456	29	28	101,918	3,229
1,2,4,5-TeCB	1	0	33	44	6	7	14,700	3,410
1,2,3,4-TeCB	1	1	100	137	19	20	50,764	5,891
PENTACHLOROBENZENE	0	0	2	13	1	6	12,786	1,608
HEXACHLOROBENZENE	0	0	2	3	0	1	392	133
NITROBENZENE	5	5	5	5	9	5	214	59
MCNB	10	8	8	6	8	8	91	88

AR308266

DATA SUMMARY
NUTRIENT COLUMN

CHLOROBENZENE TOTALS
(parts per billion)

PARAMETER	AQUEOUS SAMPLES (ug/L)						SOIL SAMPLES (ug/Kg)	
	FEED		LEACHATE					
	Day 0	Day 60	Day 0	Day 10	Day 30	Day 60	Day 0	Day 60
Mono-	4	3	86	6	2	2	1,103	4
Di-	5	14	15,403	267	22	26	69,296	33
Tri-	7	4	7,164	1,994	118	119	388,233	13,459
Tetra-	1	1	133	181	24	27	65,464	9,301
Penta-	0	0	2	13	1	6	12,786	1,608
Hexa-	0	0	2	3	0	1	392	133
Total Chlorobenzenes	17	22	22,800	2,447	162	183	537,333	24,243

DRAFT

AR308267

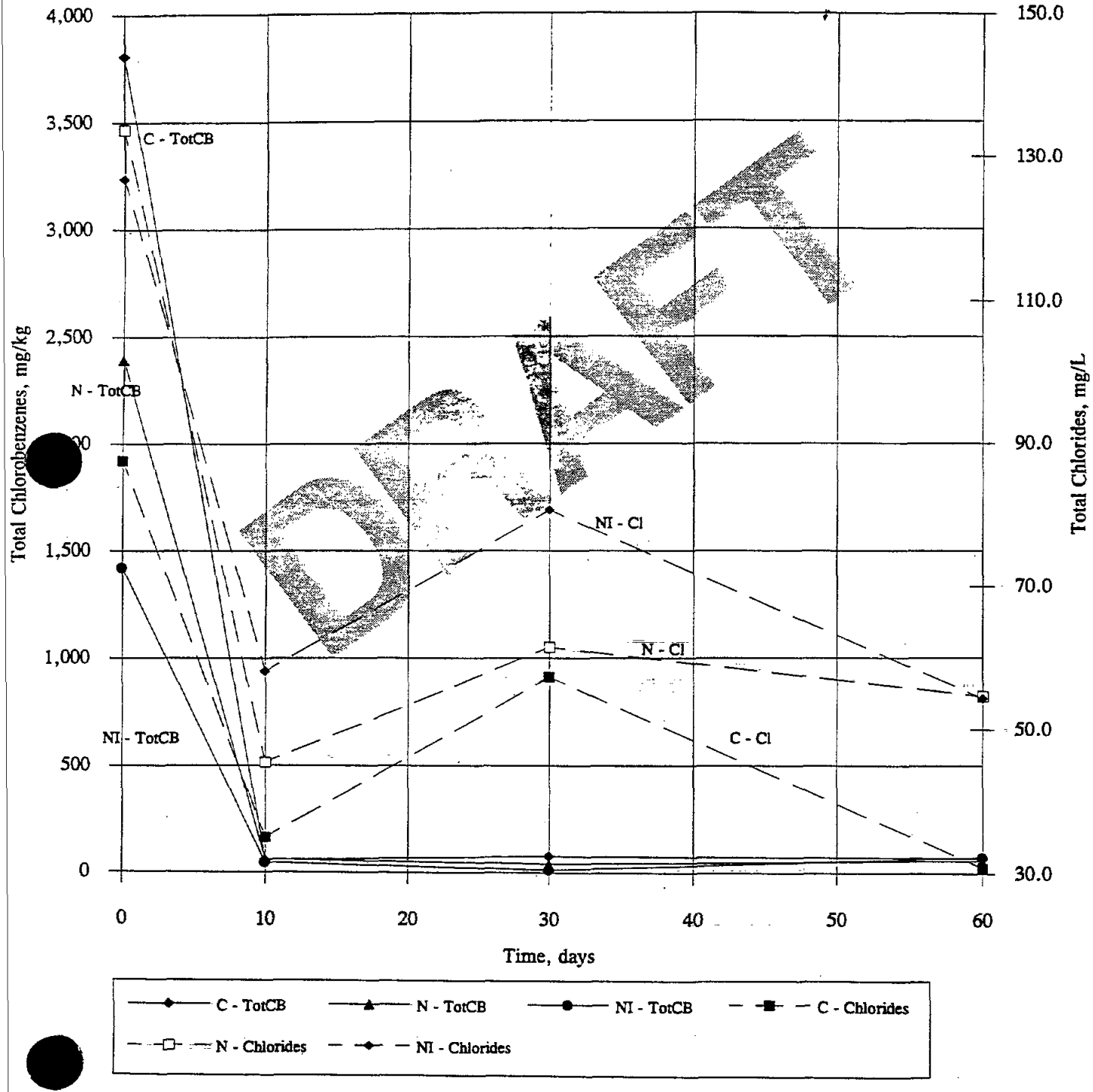
WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 10

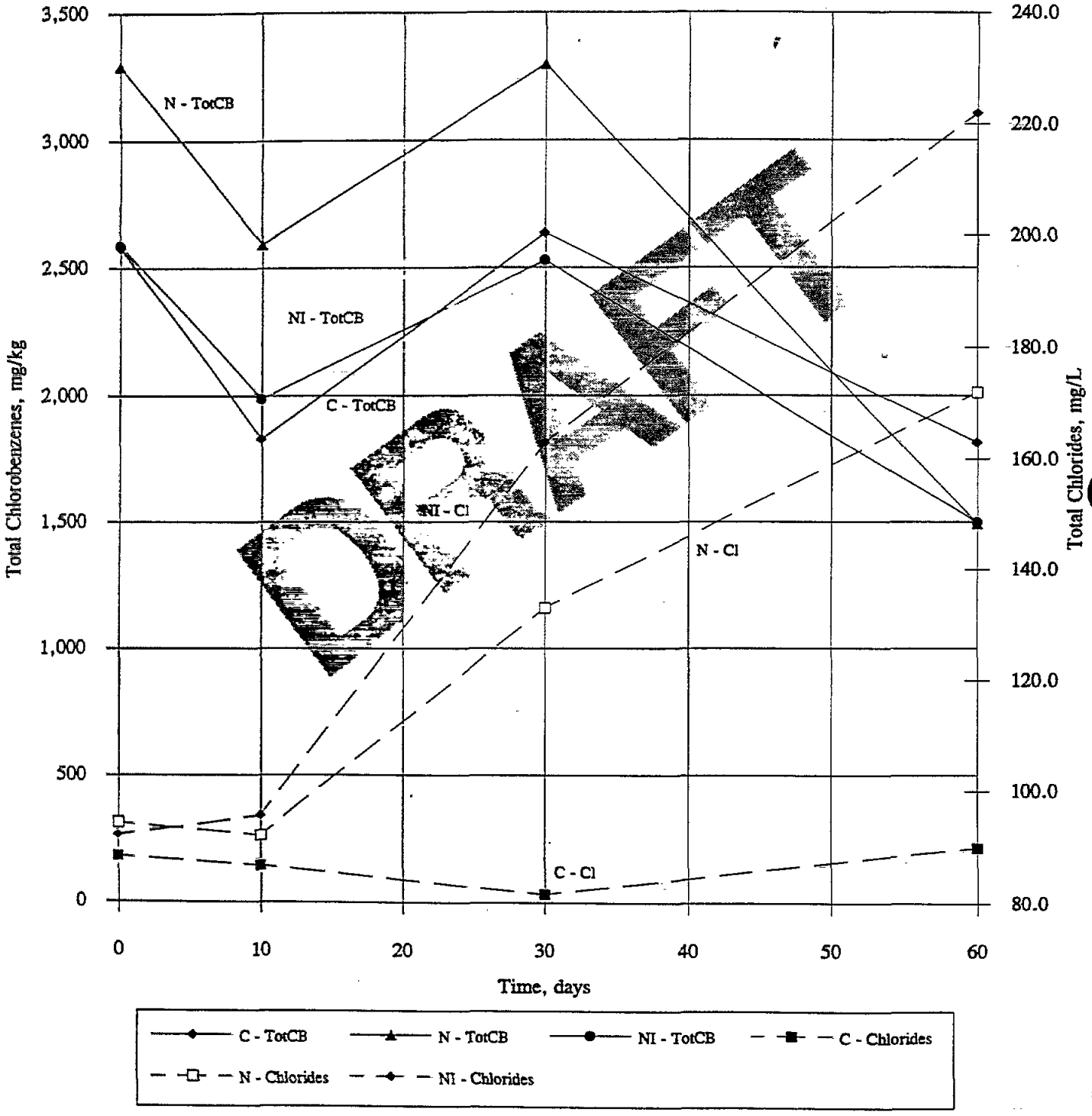
GRAPHICAL RESULTS SUMMARIES

Figure 2
SURFACE SOIL - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time



DRAFT

Figure 3
SURFACE SOIL - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time



[BOOKA-AN.XLW] Tot Cl

AR308270

9/26/93

Figure 4
SUBSURFACE SOIL - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

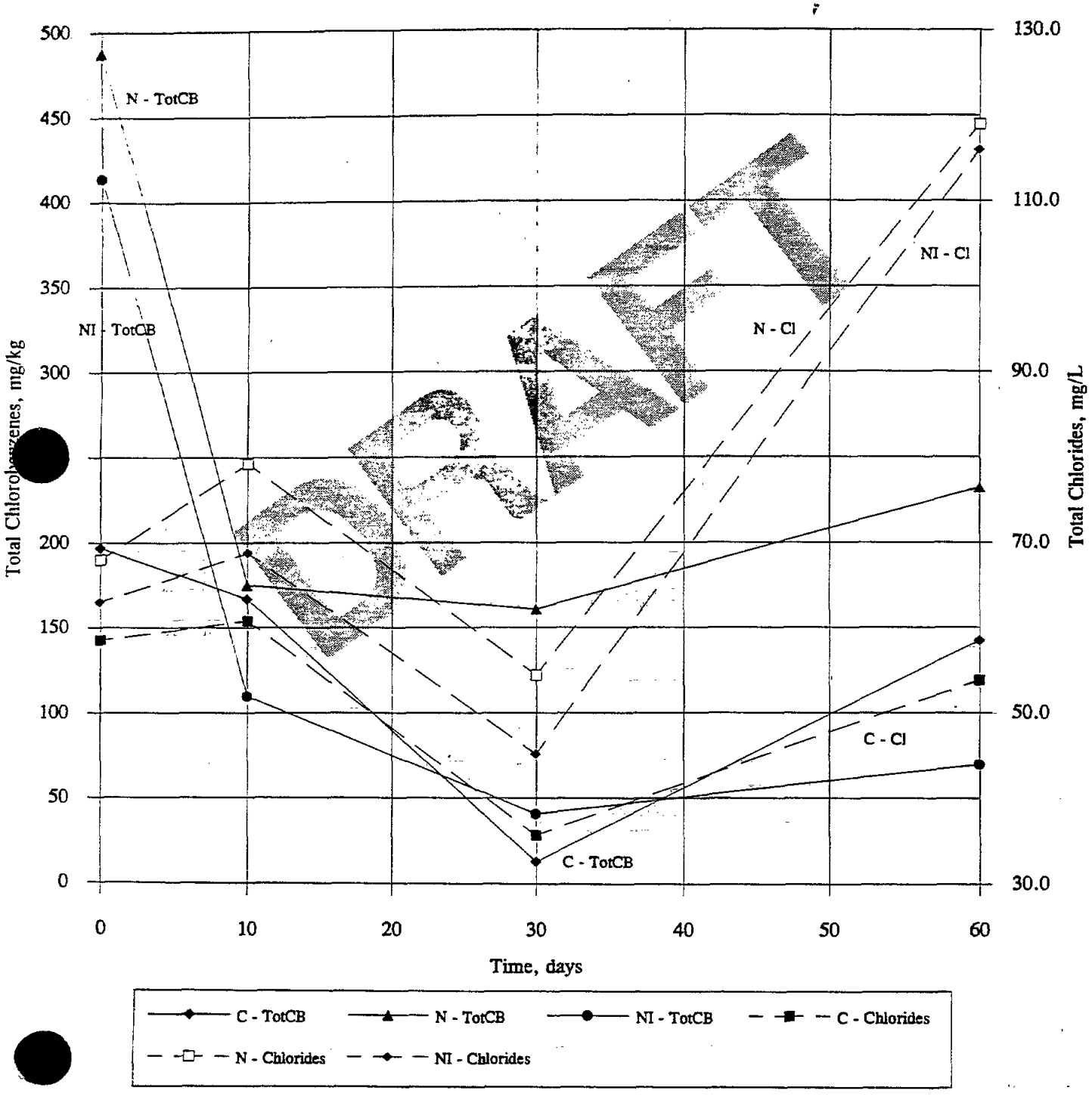
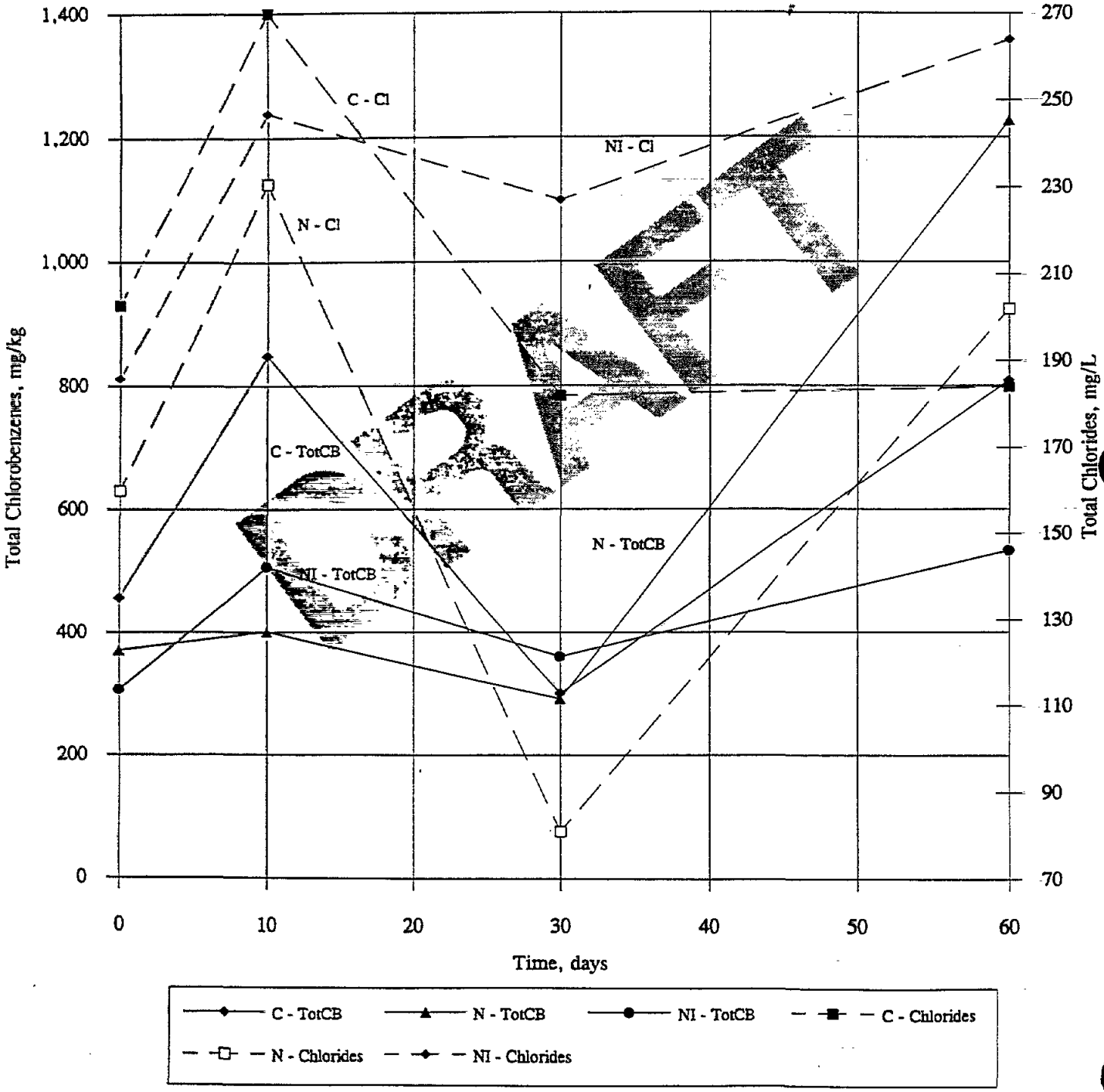


Figure 5
SUBSURFACE SOIL - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time



[BOOKB-AN.XLW]Chart-TotCB

AR308272

9/26/93

Figure 6
SEDIMENT - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

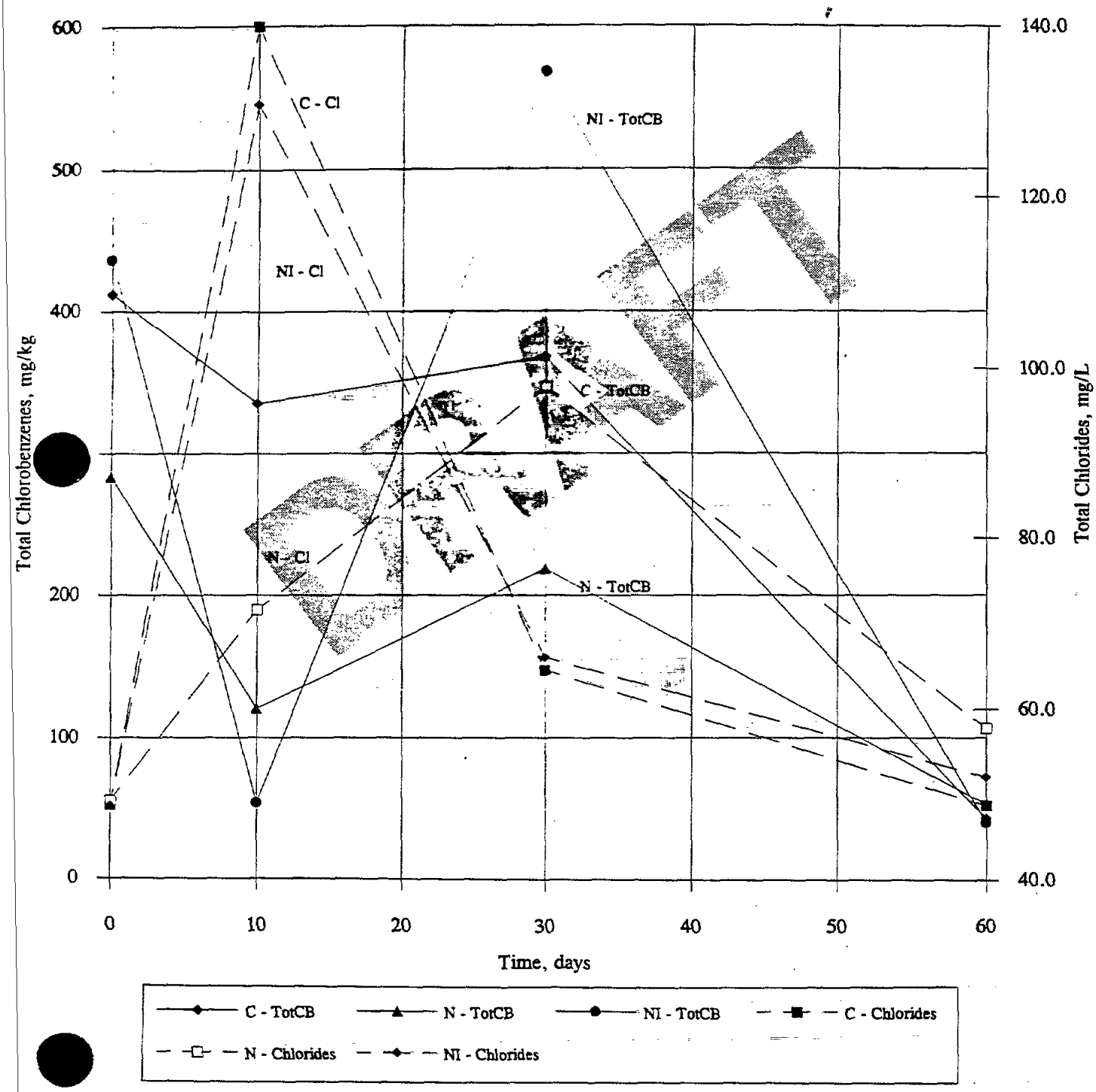
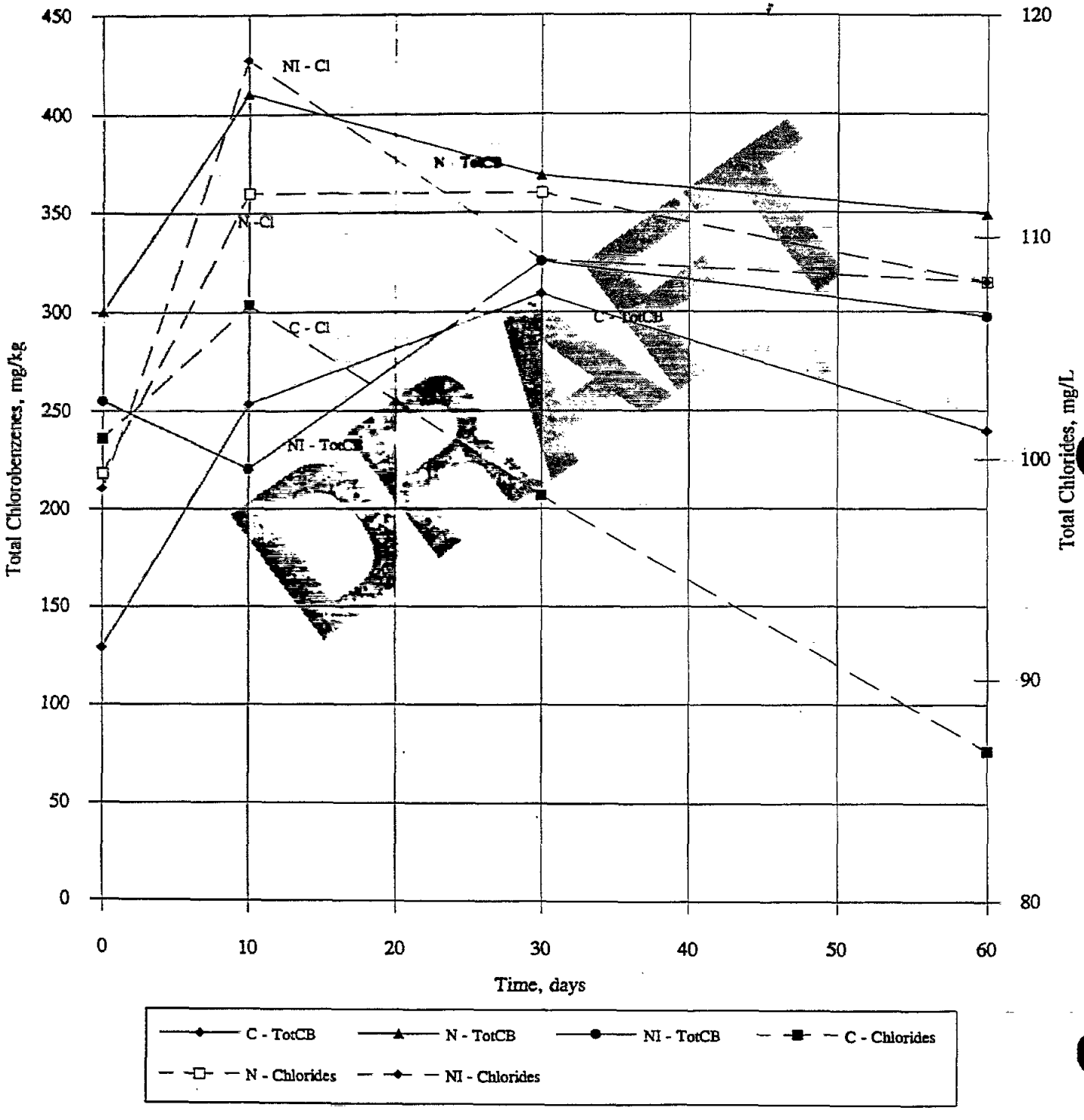


Figure 7
SEDIMENT - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time



[BOOKC-AN.XLW]ChartTotCB

AR308274

9/26/93

WESTON

MANAGERS DESIGNERS/CONSULTANTS

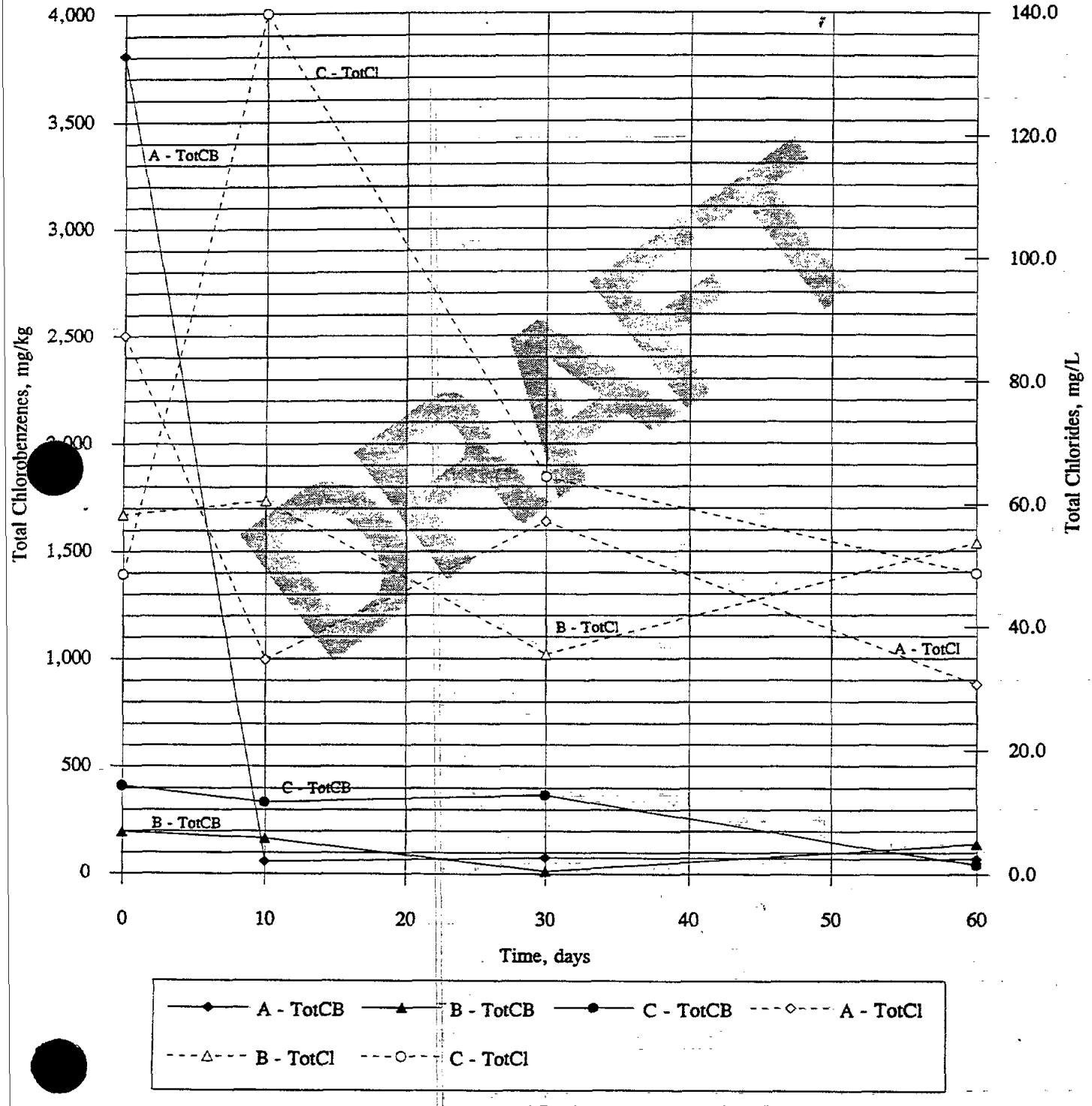
DRAFT

ATTACHMENT 10A

SOIL TYPE COMPARISON

CONTROL - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



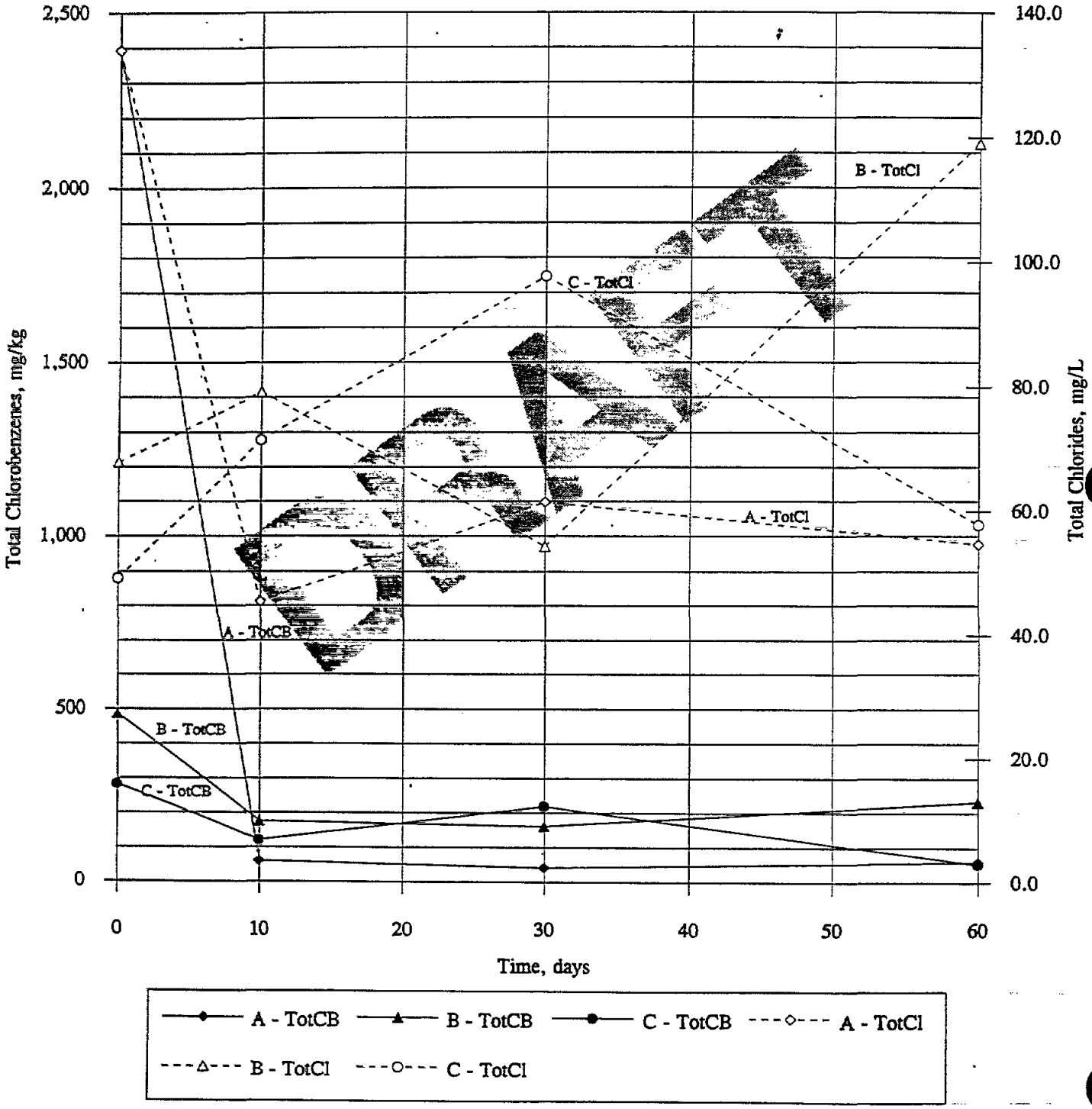
[CONTROL.XLW]ChrtC-AE

AR308276

9/26/93

NUTRIENT - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



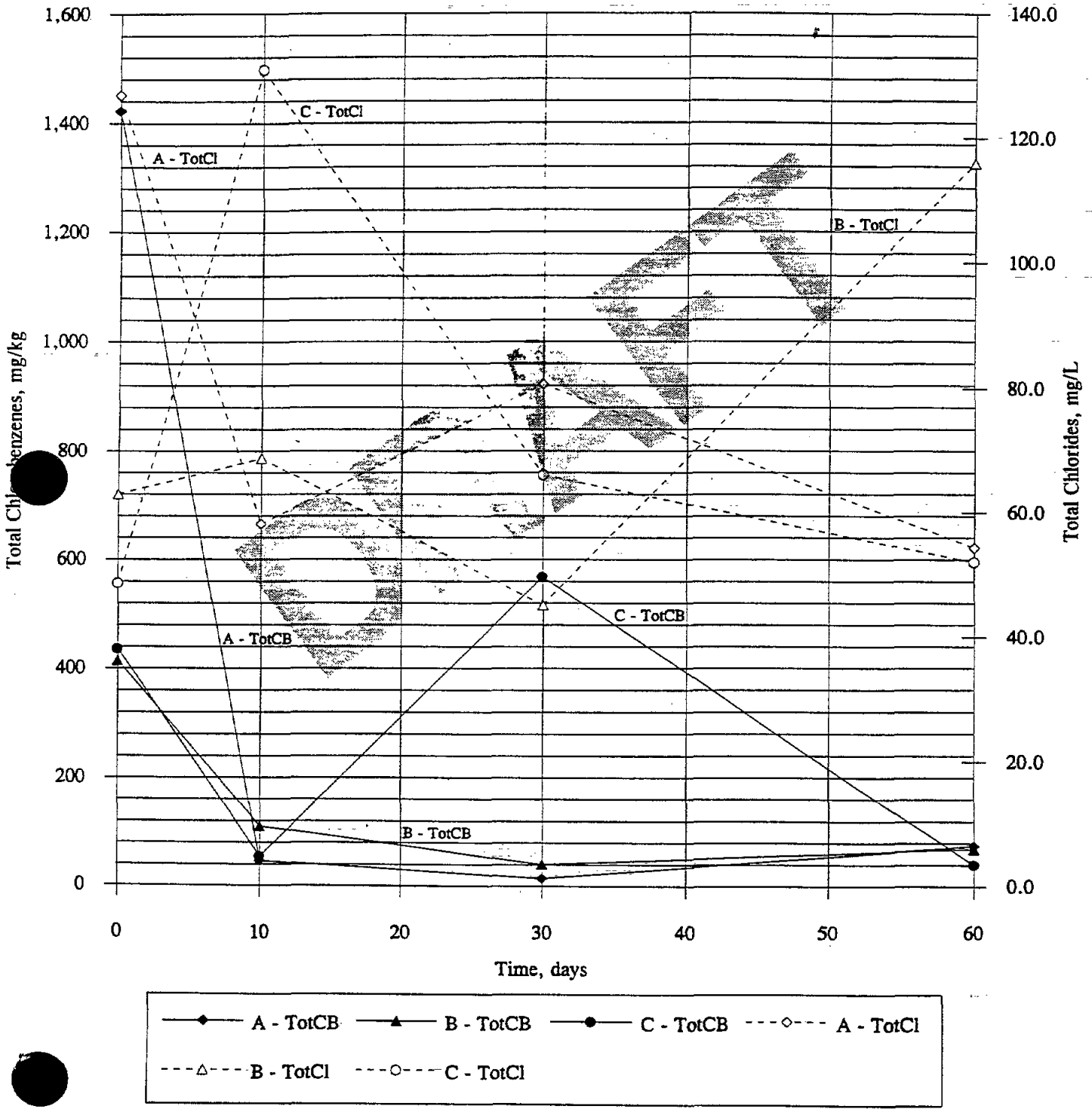
[NUTRIENT.XLW]ChrtN-AE

AR308277

9/26/93

NUTRIENT & INOCULATED - AEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



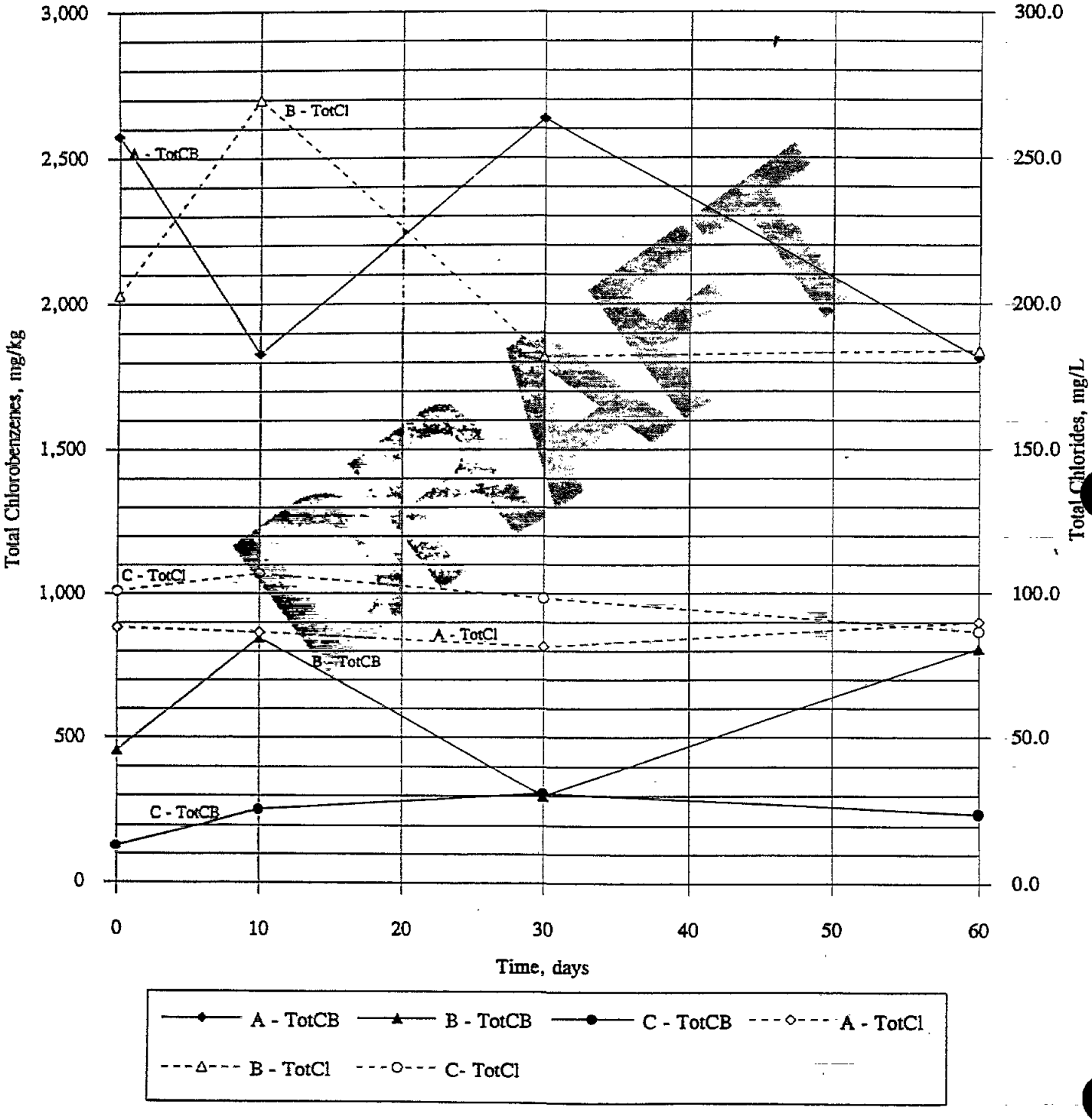
[NUTRINOC.XLW]ChtNI-AE

AR308278

9/26/93

CONTROL - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



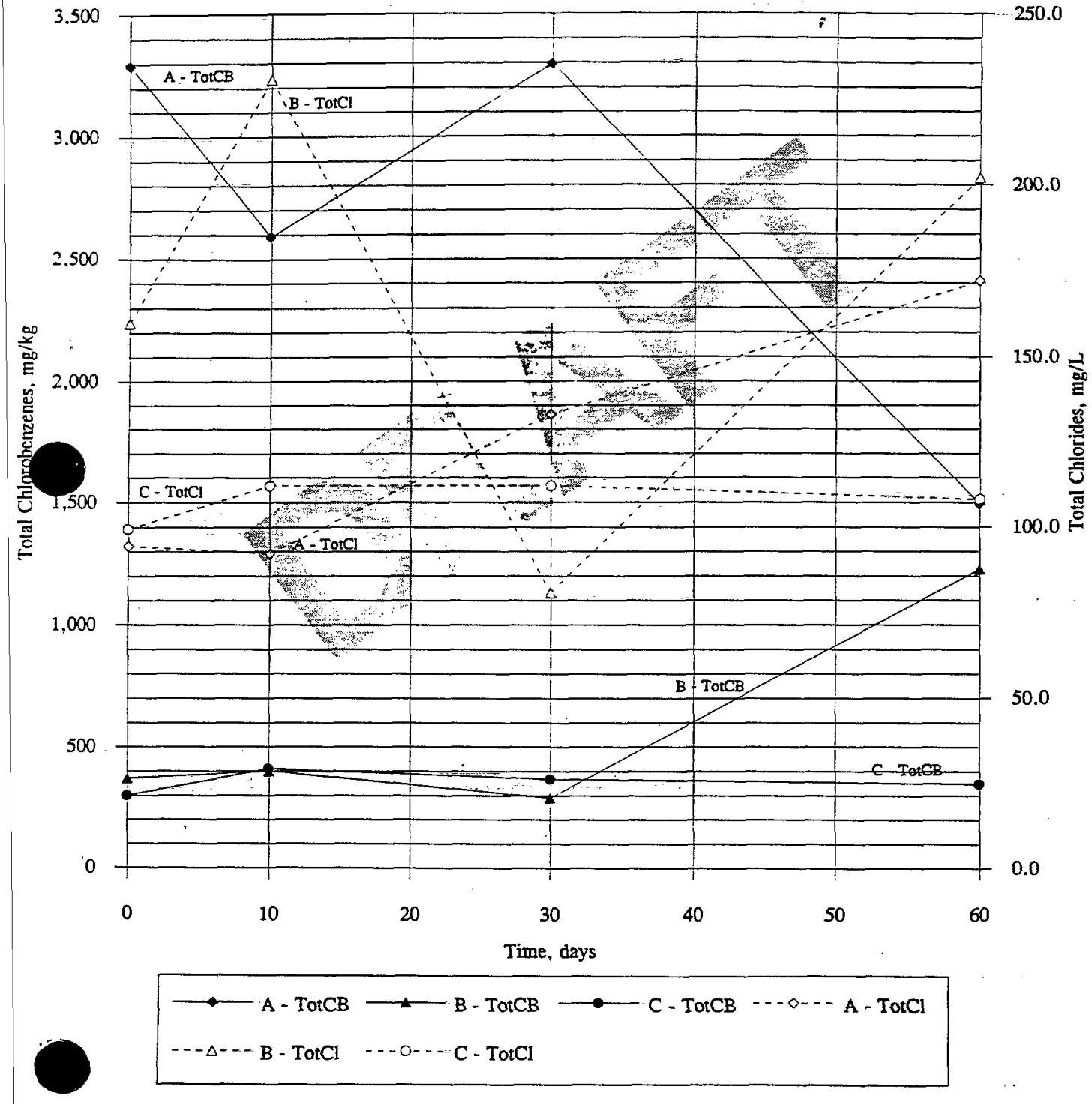
[CONTROL.XLW]ChrtC-AN

AR308279

9/26/93

NUTRIENT - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



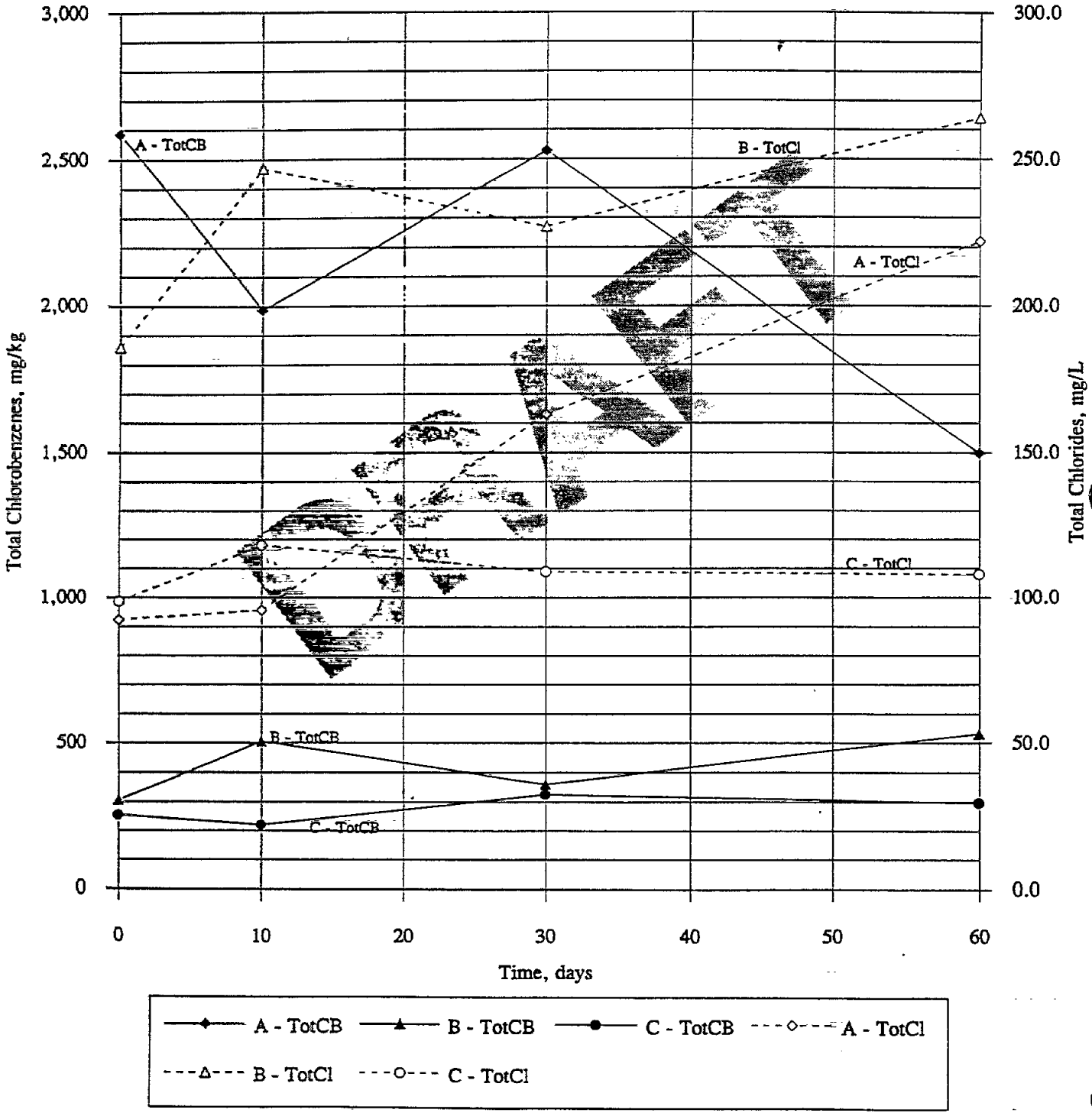
[NUTRIENT.XLW]ChrtN-AN

AR308280

9/26/93

NUTRIENT & INOCULATED - ANAEROBIC
Total Chlorobenzenes and Total Chlorides vs. Time

A = Surface soil, B = Subsurface soil, C = Sediment



[NUTRINOC.XLW]ChtNI-AN

AR308281

9/26/93

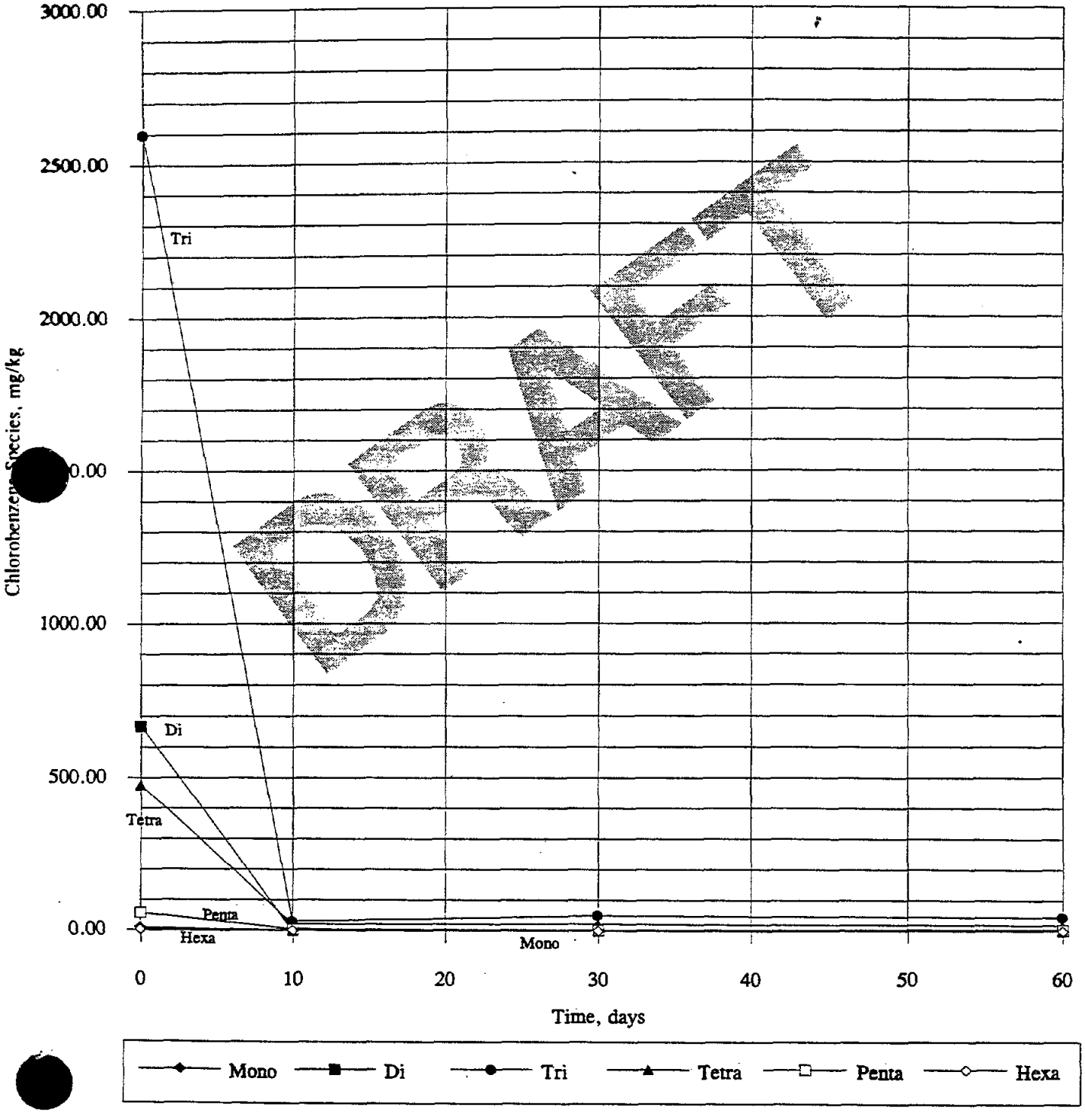
WESTON

MANAGERS DESIGNERS CONSULTANTS

ATTACHMENT 10B

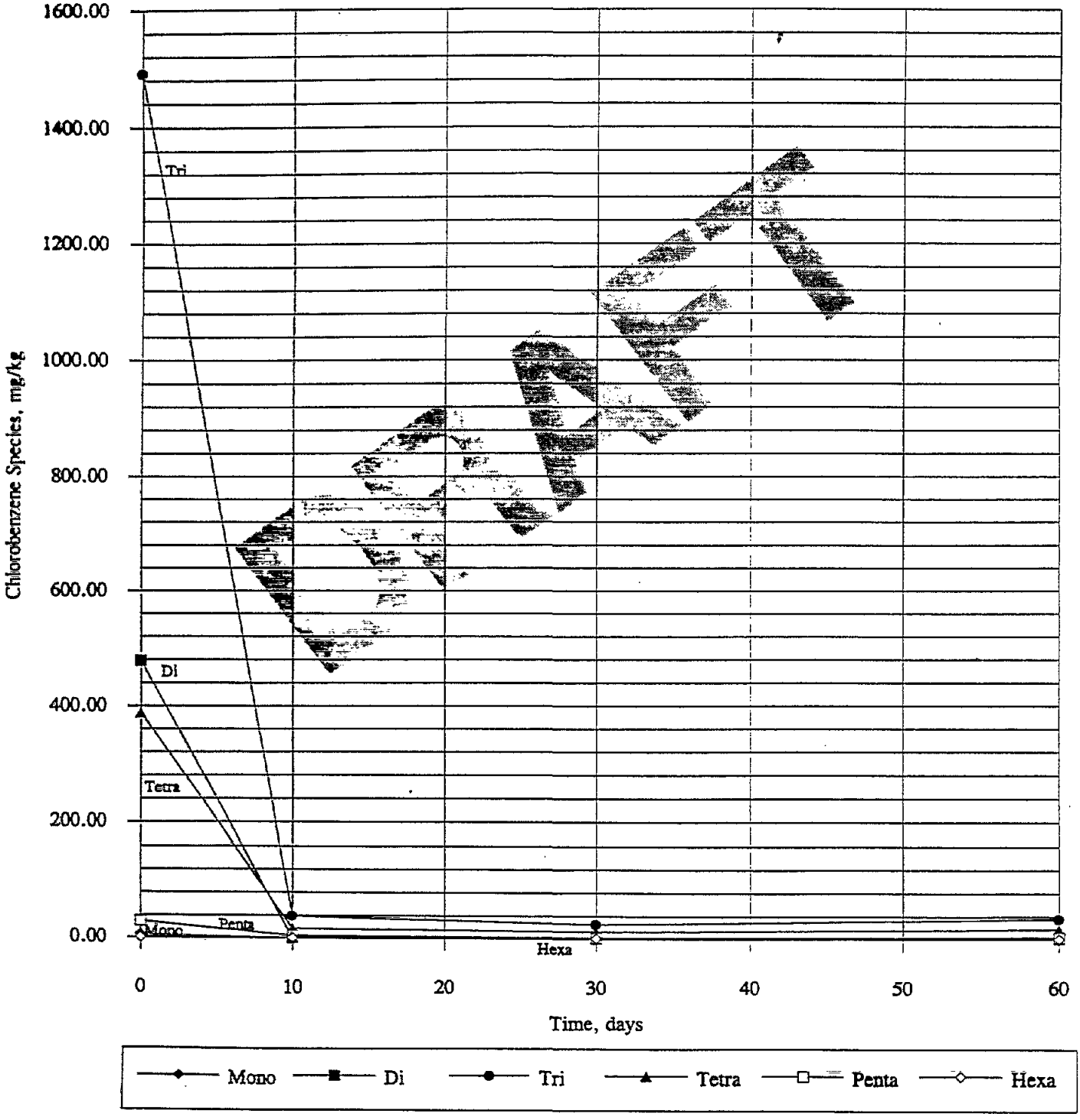
CHLOROBENZENE SPECIES COMPARISON

SURFACE SOIL - AEROBIC - CONTROL
Chlorobenzene Species vs. Time

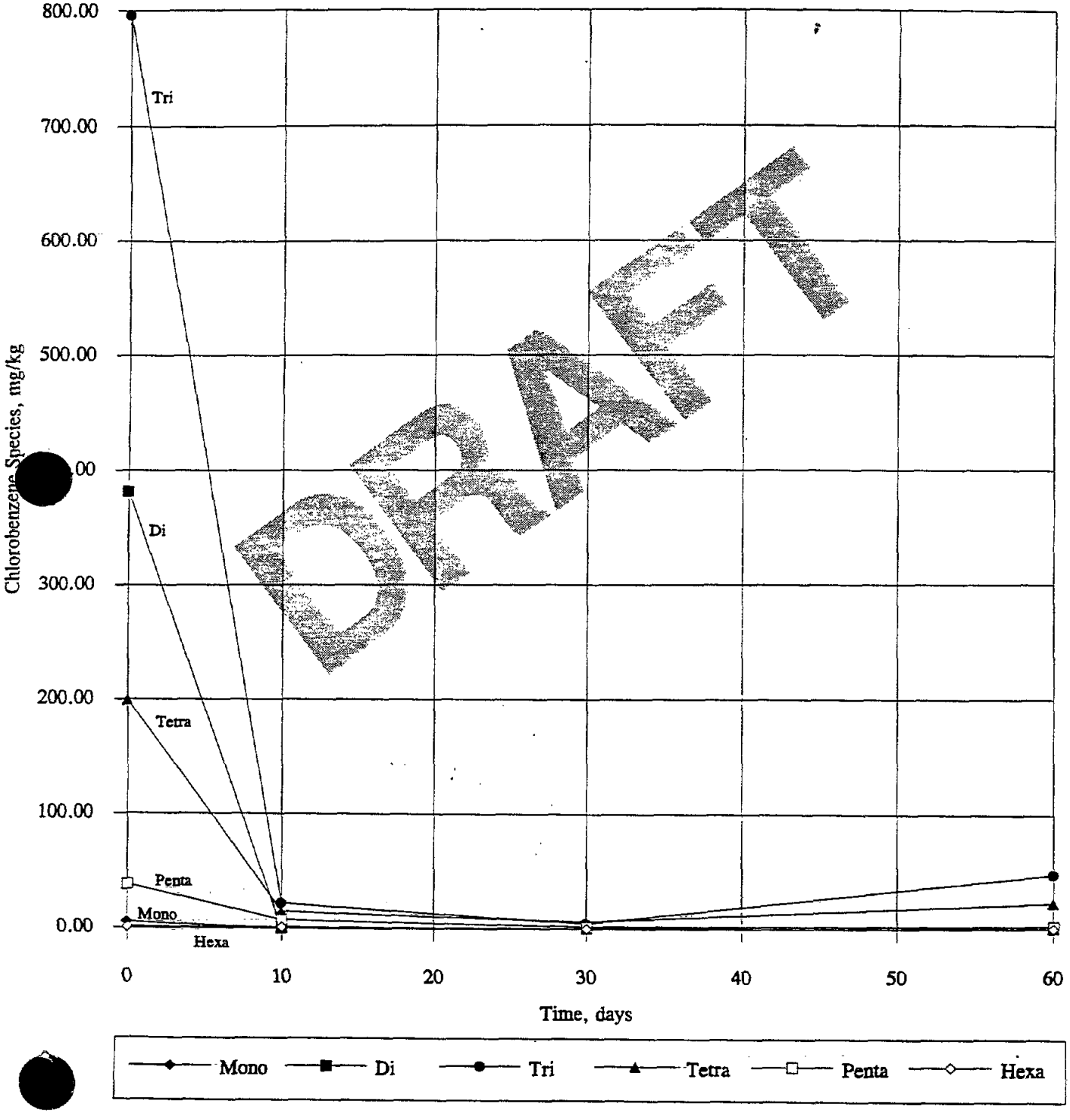


DRAFT

SURFACE SOIL - AEROBIC - NUTRIENT
Chlorobenzene Species vs. Time



SURFACE SOIL - AEROBIC - NUTRIENT & INOCULATED
Chlorobenzene Species vs. Time

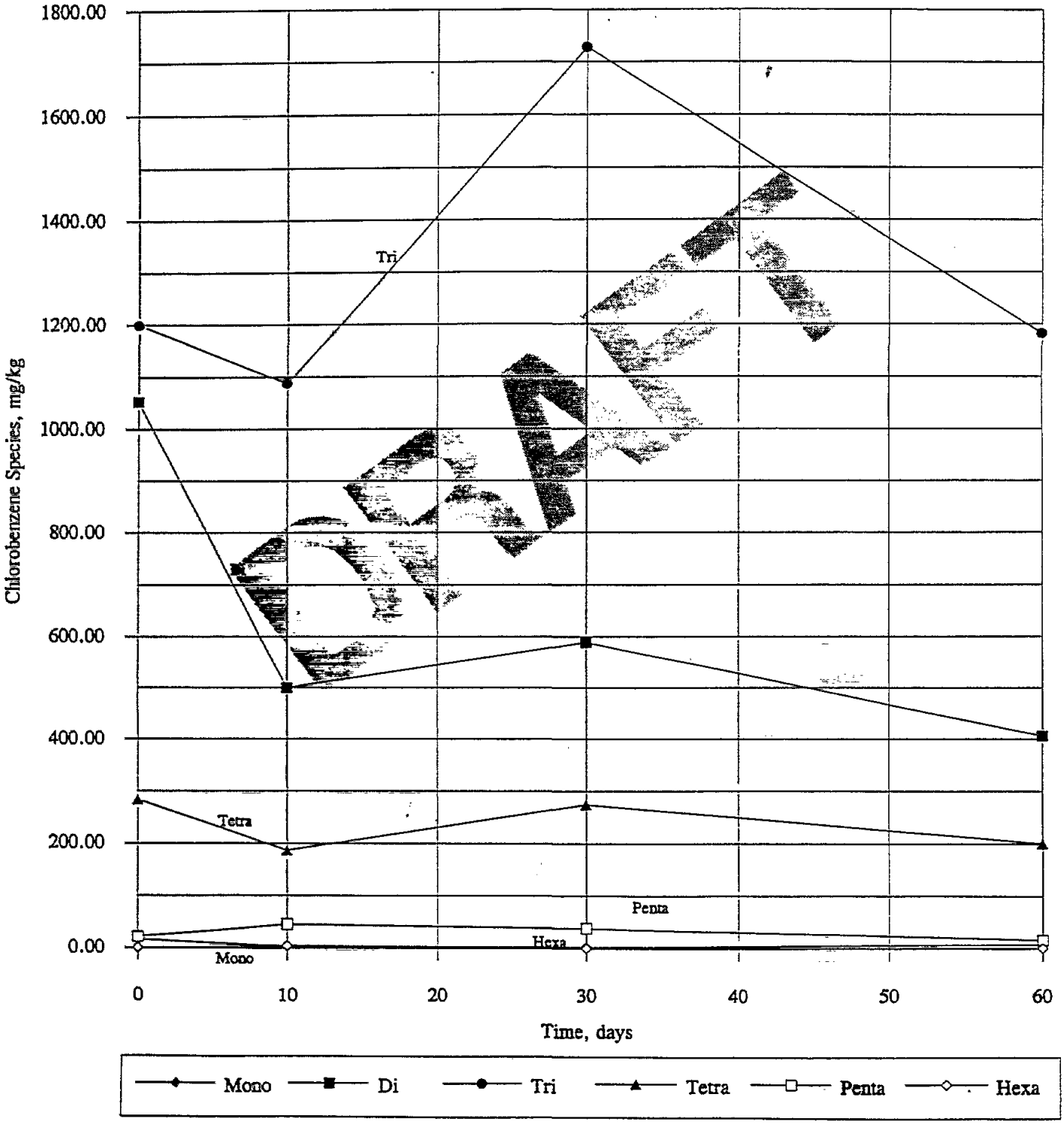


DRAFT

[BOOKA-AE.XLW]niSpecies

9/26/93

SURFACE SOIL - ANAEROBIC - CONTROL
Chlorobenzene Species vs. Time

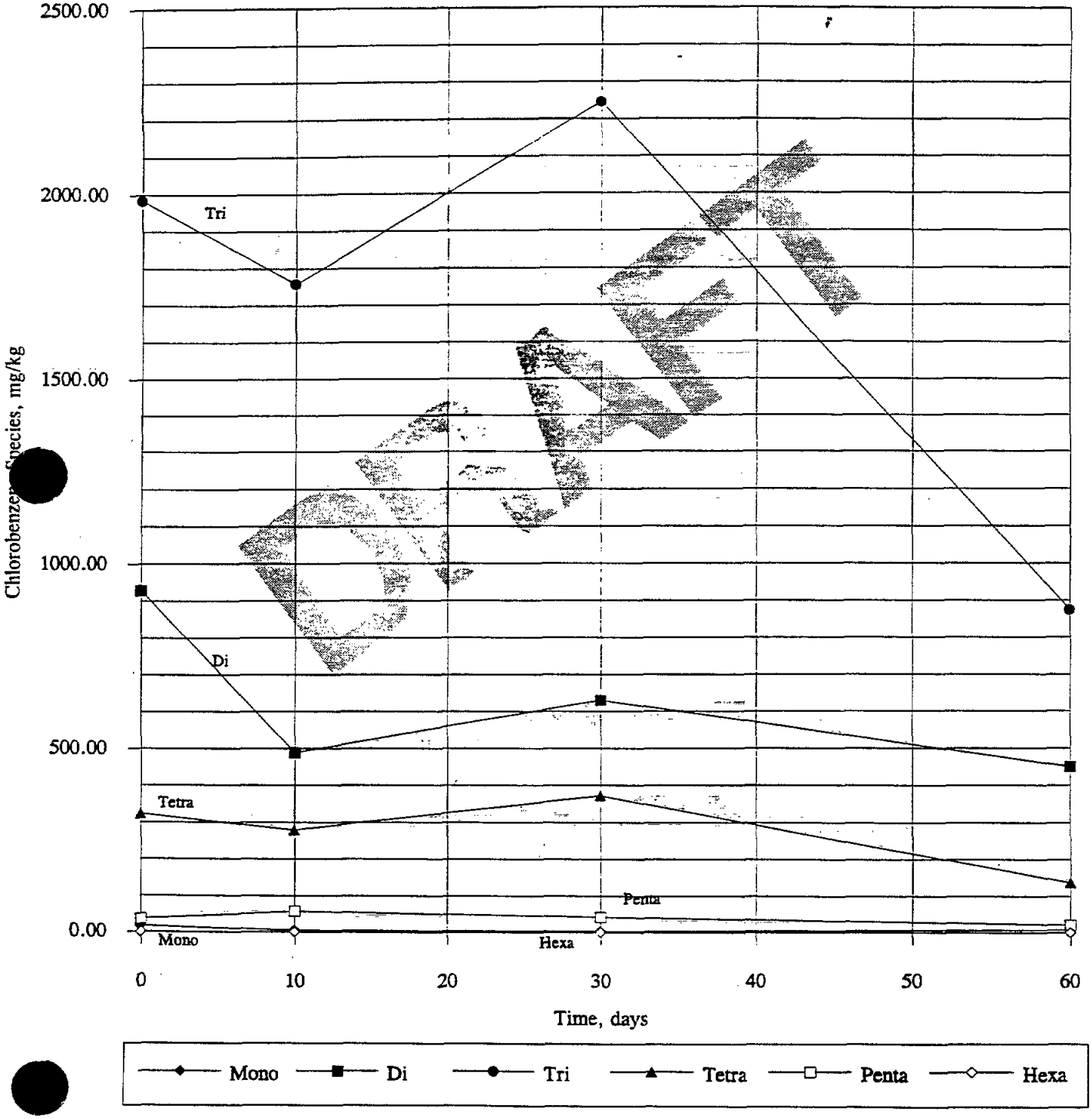


DRAFT

[BOOKA-AN.XLW]cSpecies

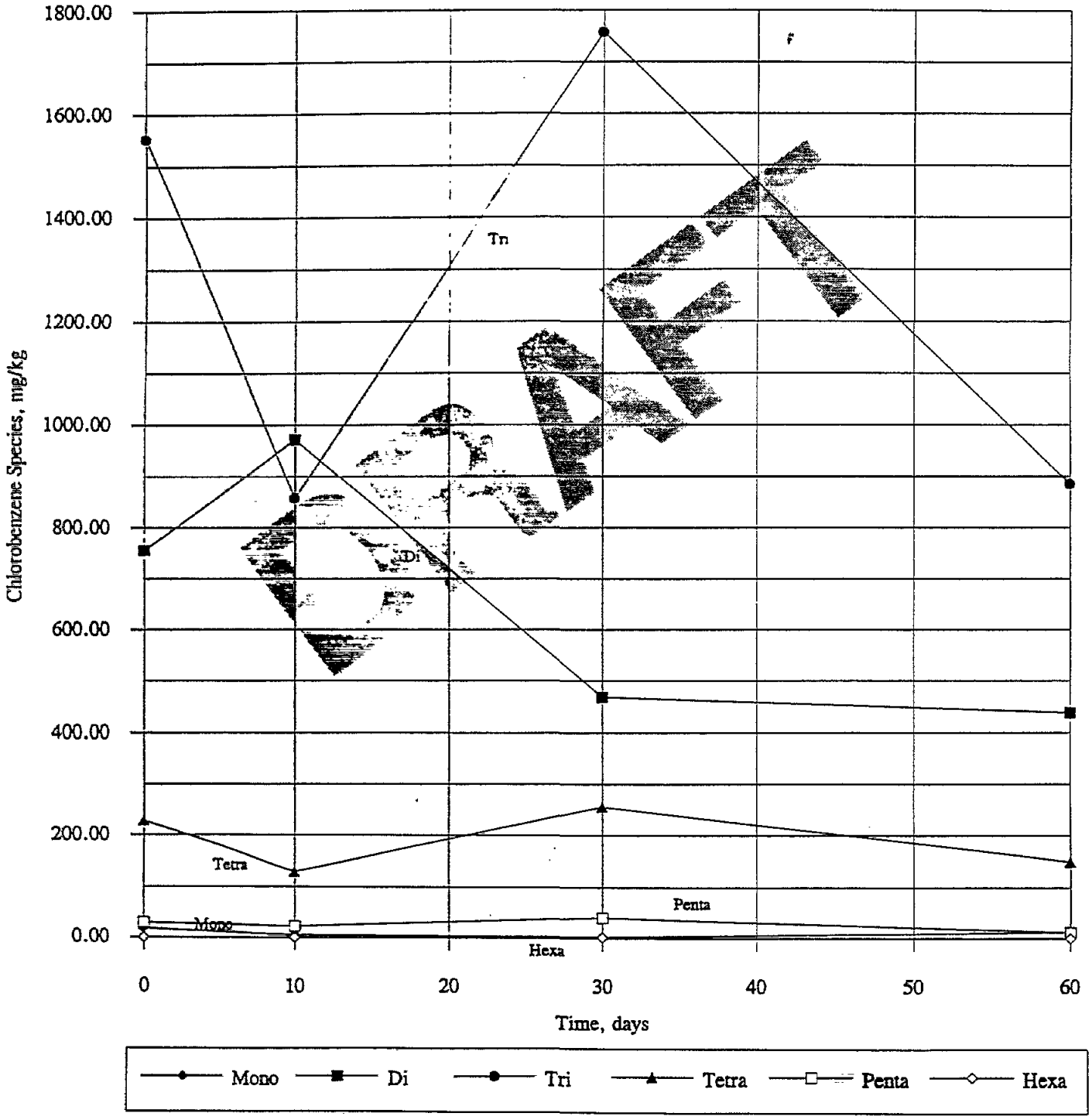
9/26/93

SURFACE SOIL - ANAEROBIC - NUTRIENT
Chlorobenzene Species vs. Time



DRAFT

SURFACE SOIL - ANAEROBIC - NUTRIENT & INOCULATED
Chlorobenzene Species vs. Time



DRAFT

[BOOKA-AN.XLW]niSpecies

9/26/93

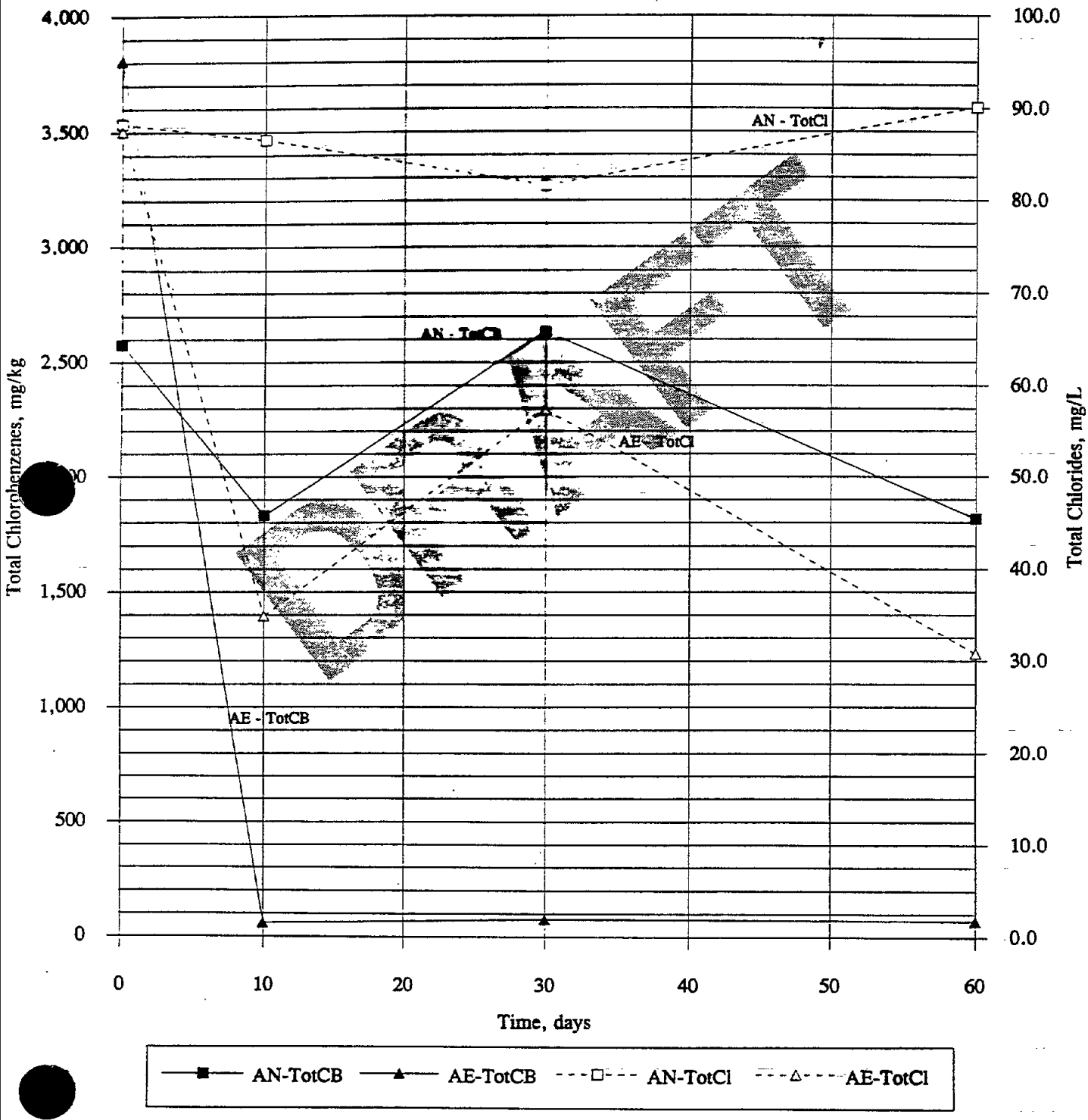
WESTON
MANAGERS DESIGNERS/CONSULTANTS

DRAFT

ATTACHMENT 10C

CHEMICAL ADDITIVE COMPARISON

SURFACE SOIL - CONTROL
Total Chlorobenzenes vs. Time

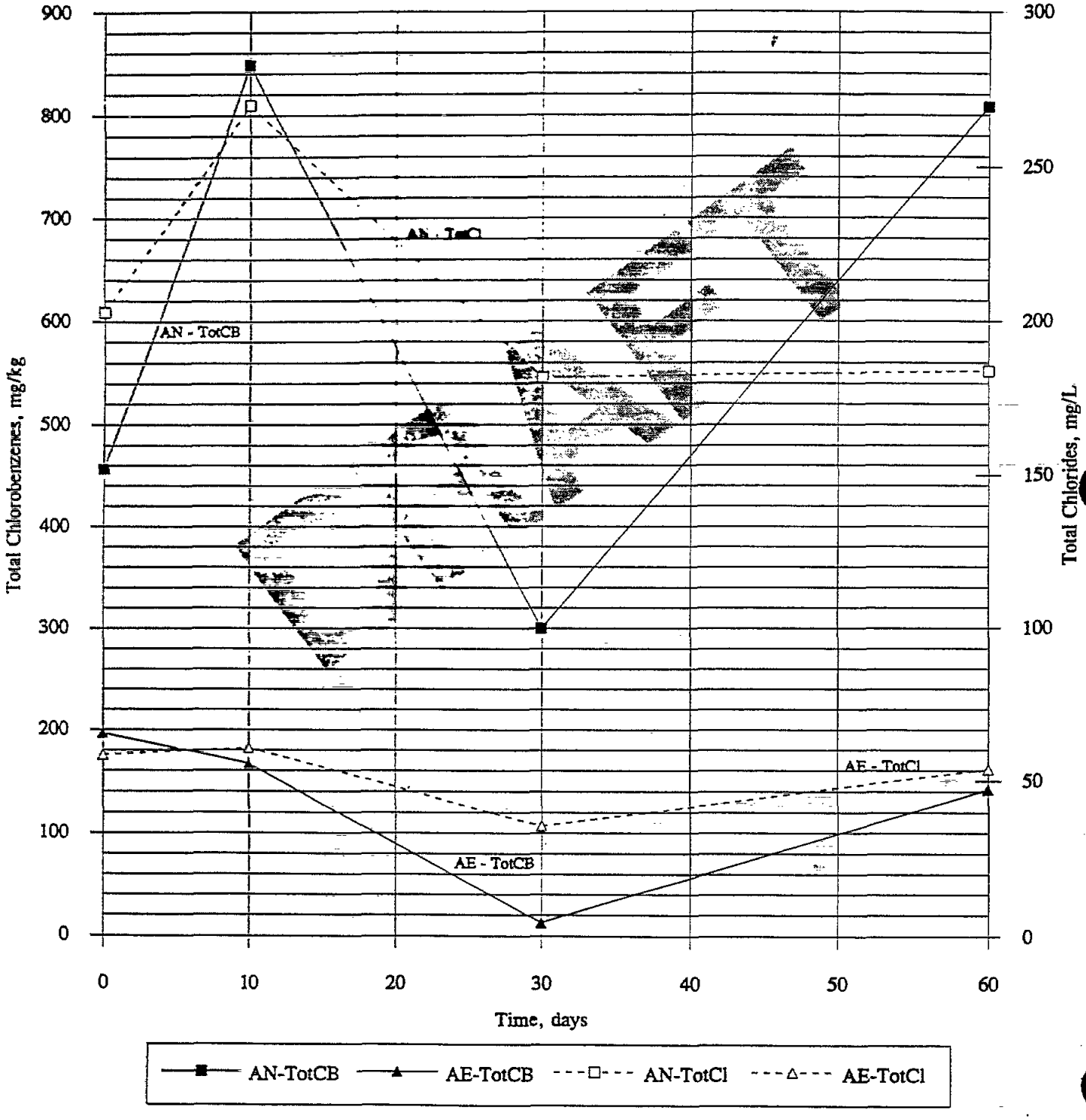


[CONTROL.XLW]ChrtA-C

AR308290

9/26/93

SUBSURFACE SOIL - CONTROL
Total Chlorobenzenes vs. Time

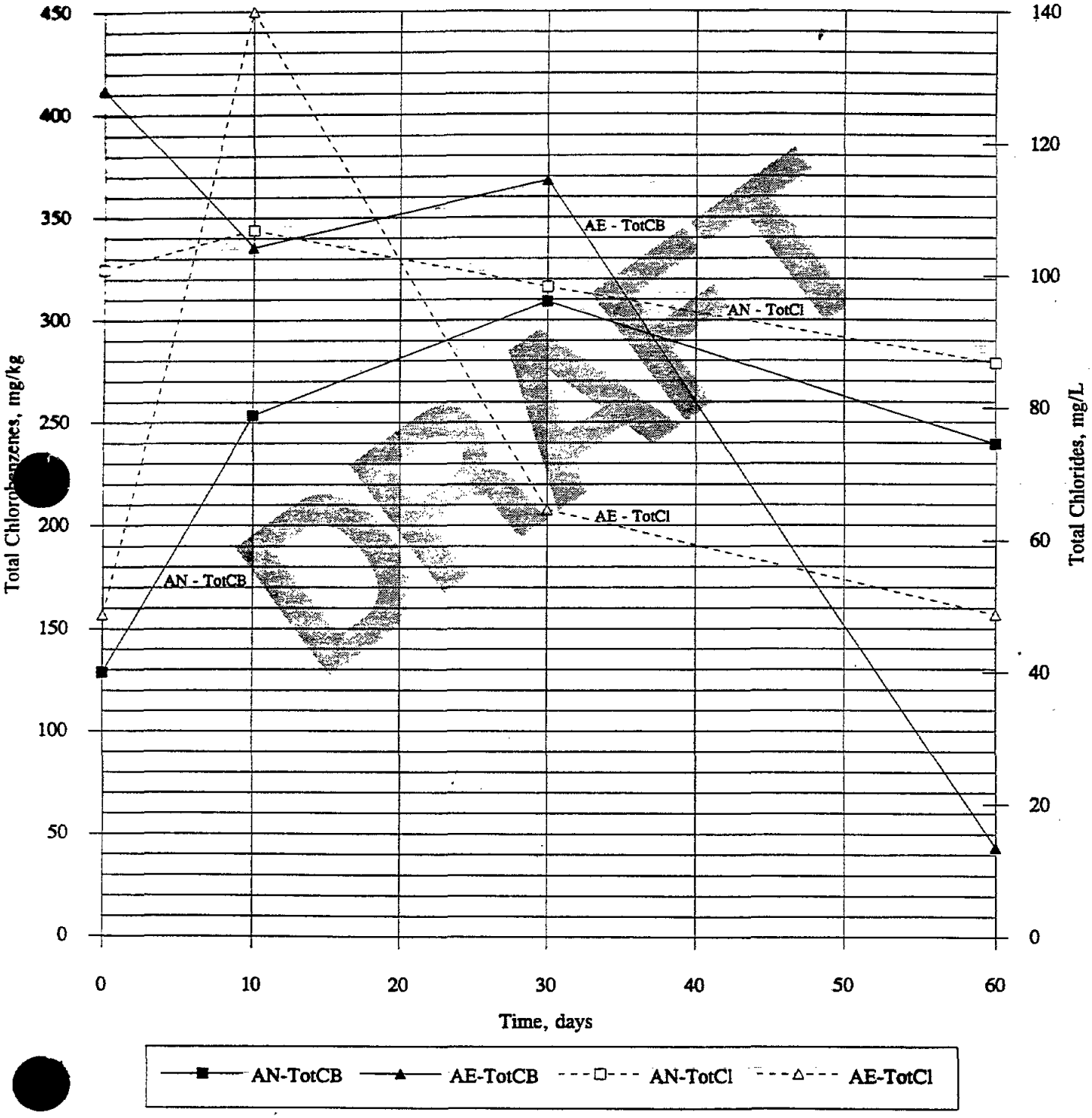


[CONTROL.XLW]ChrtB-C

9/26/93

AR308291

SEDIMENT - CONTROL
Total Chlorobenzenes vs. Time

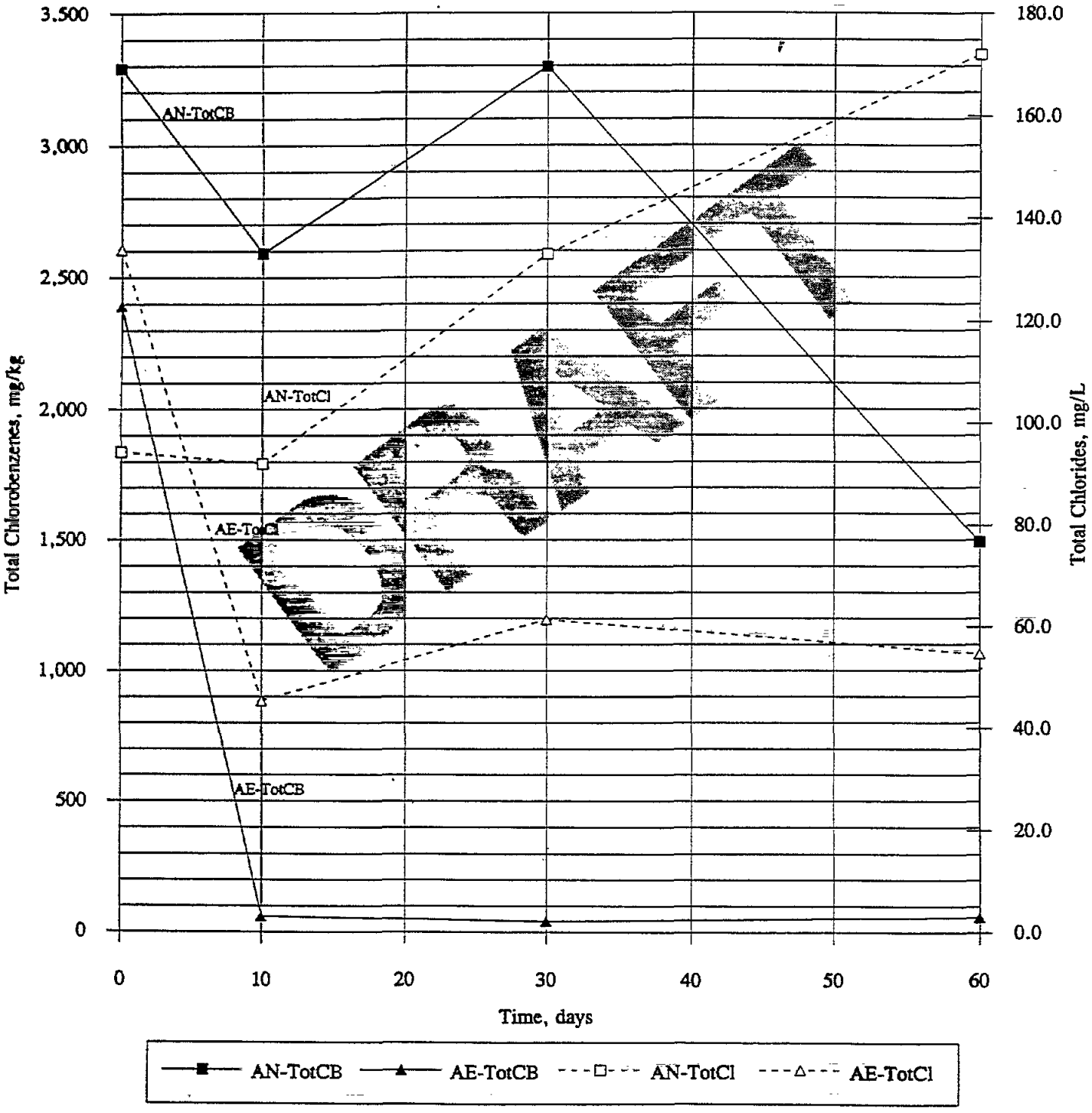


[CONTROL.XLW]ChrtC-C

AR308292

9/26/93

SURFACE SOIL - NUTRIENT
Total Chlorobenzenes and Total Chlorides vs. Time

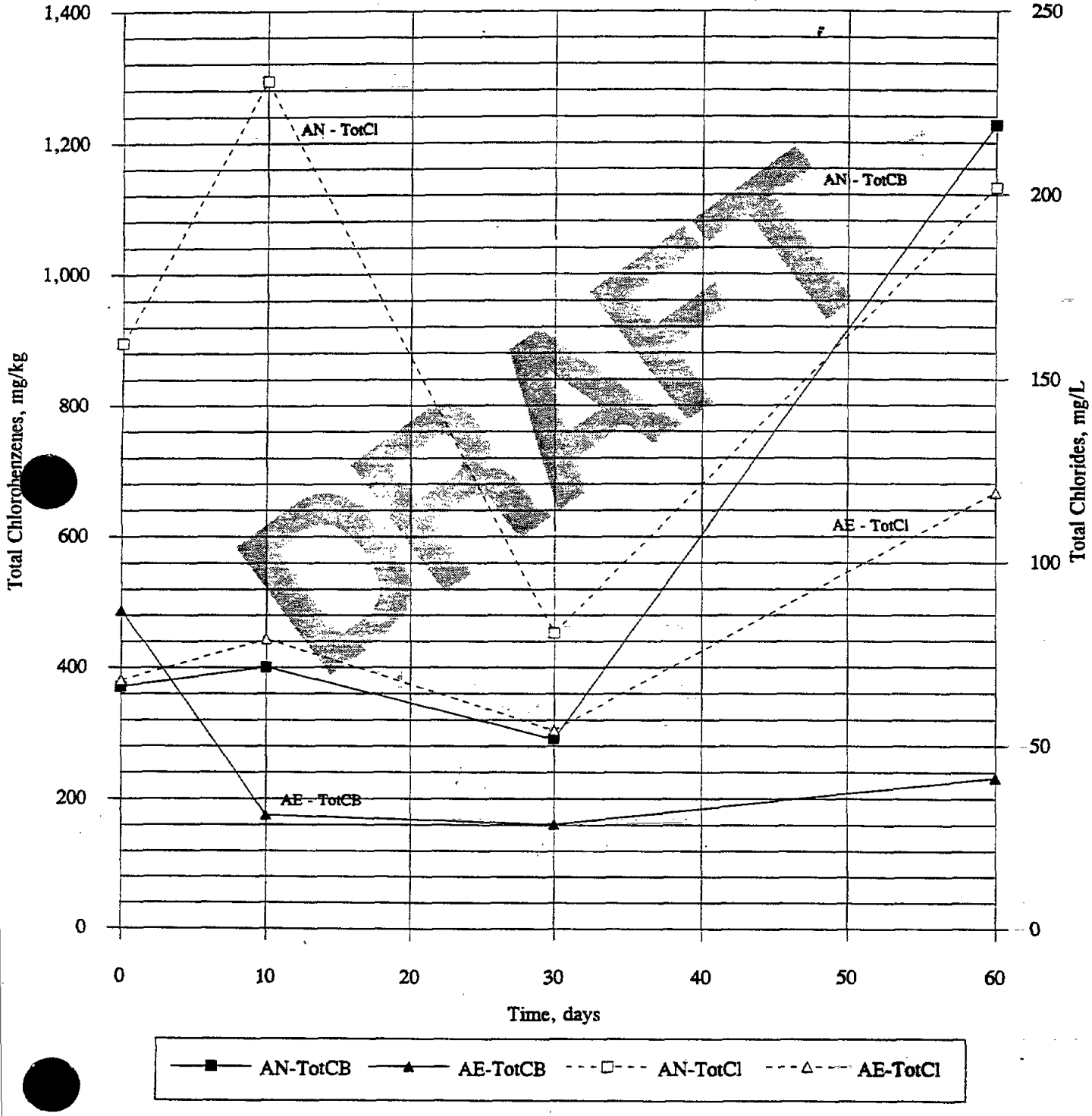


[NUTRIENT.XLW]ChrtA-N

9/26/93

AR308293

SUBSURFACE SOIL - NUTRIENT
Total Chlorobenzenes and Total Chlorides vs. Time



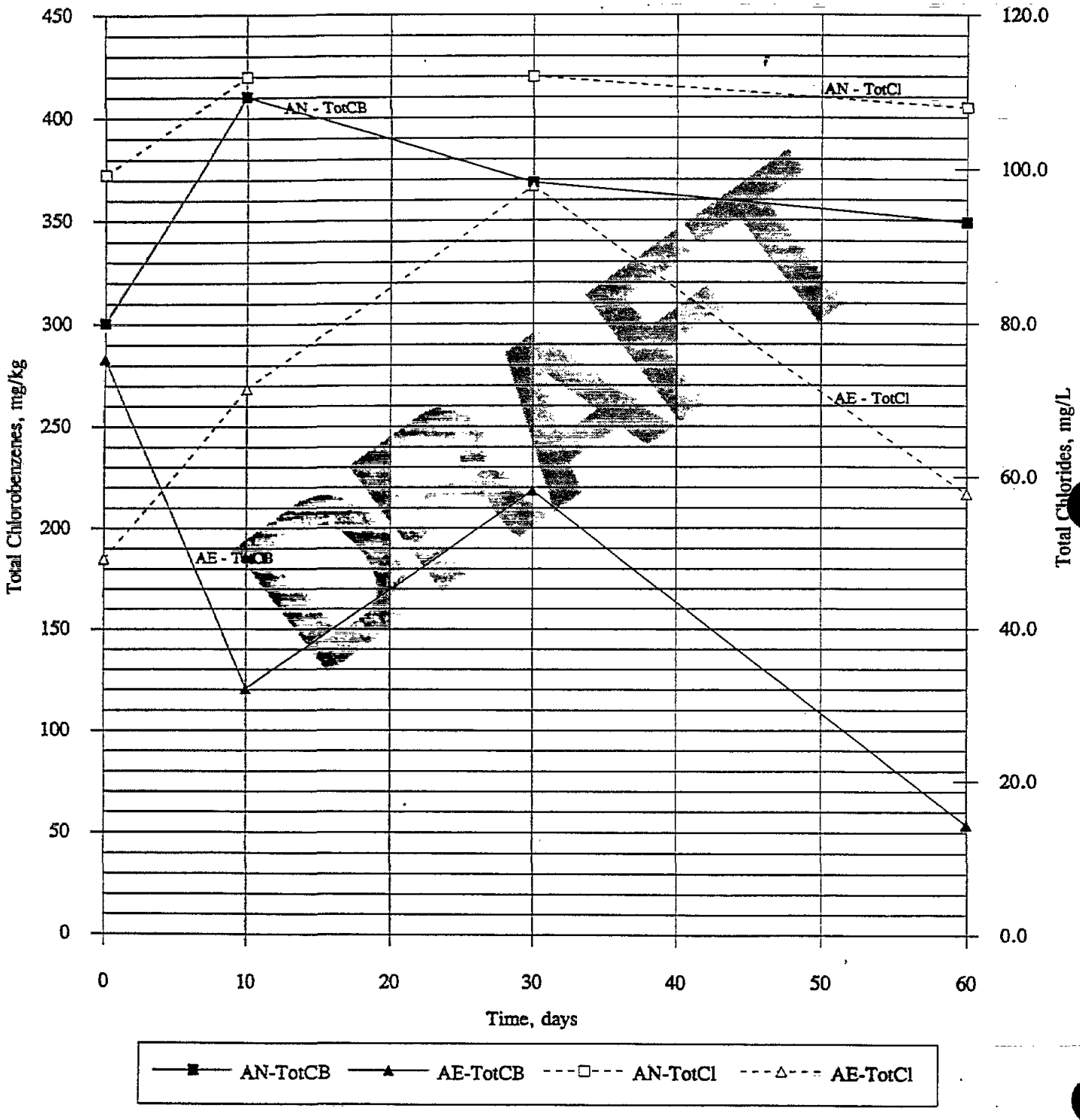
DRAFT

[NUTRIENT.XLW]ChrtB-N

AR308294

9/26/93

SEDIMENT - NUTRIENT
Total Chlorobenzenes and Total Chlorides vs. Time

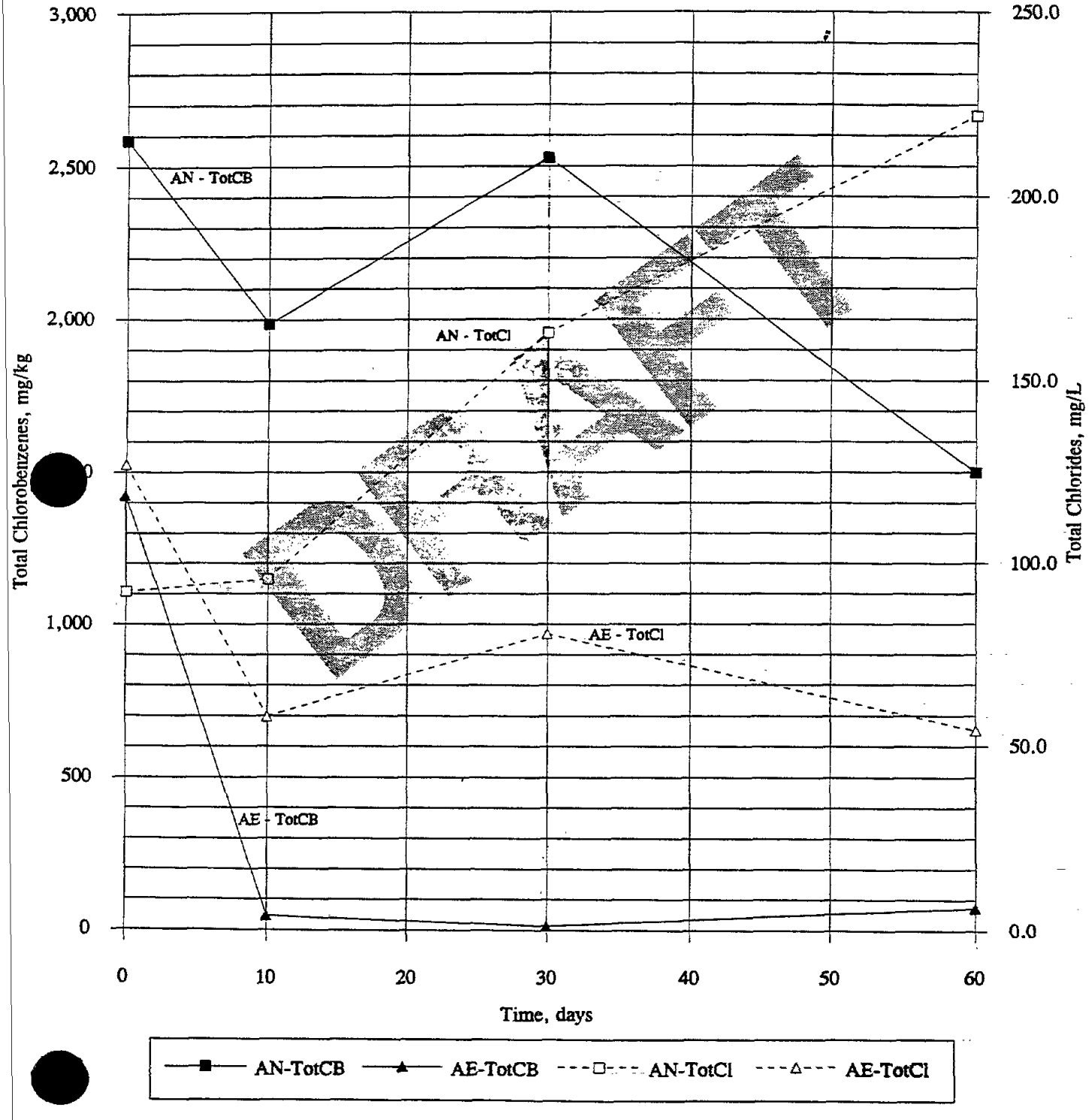


[NUTRIENT.XLW]ChrtC-N

AR308295

9/26/93

SURFACE SOIL - NUTRIENT & INOCULATED
Total Chlorobenzenes and Total Chlorides vs. Time

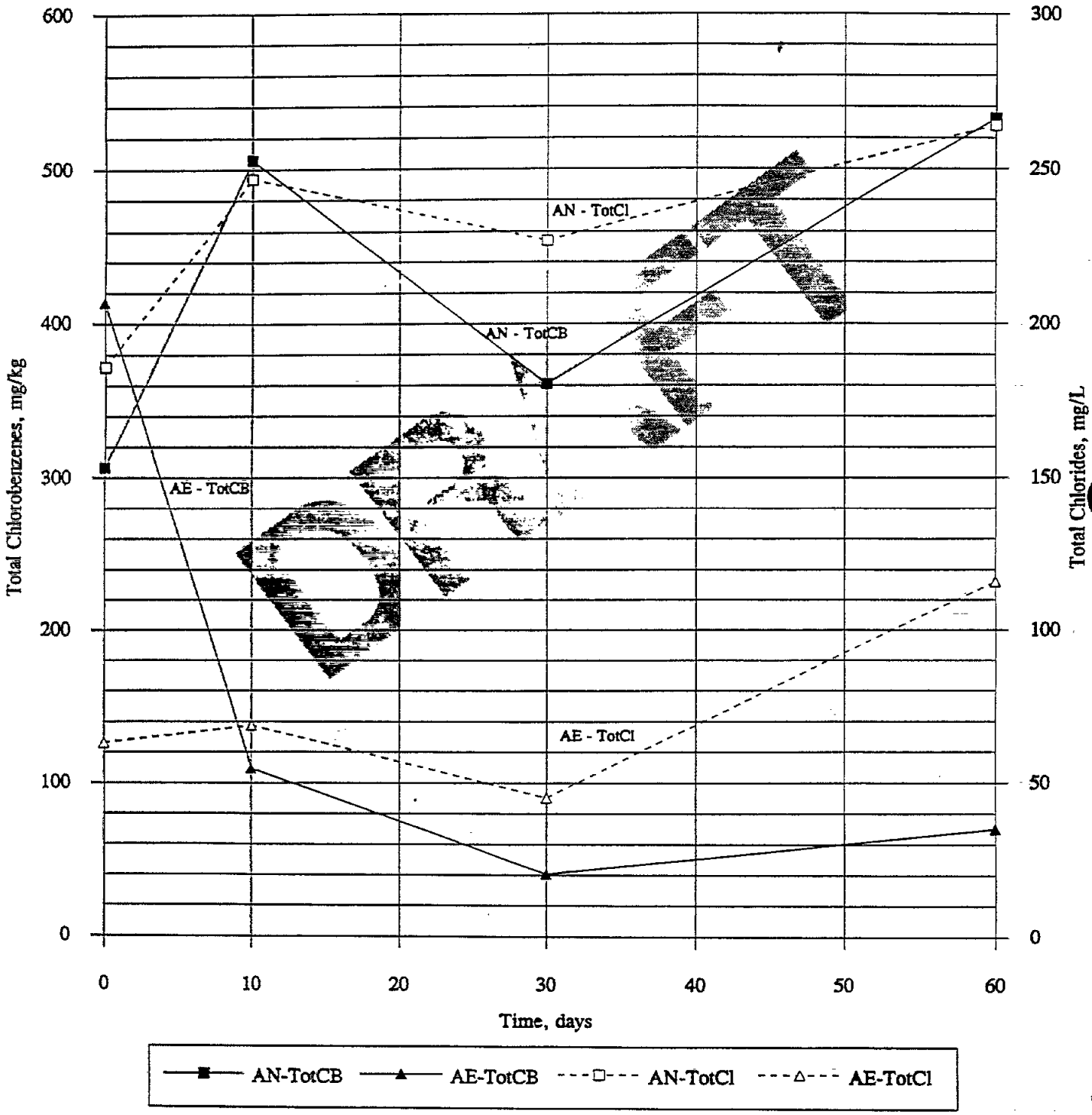


[NUTRINOC.XLW]ChrtA-NI

AR308296

9/26/93

SUBSURFACE SOIL - NUTRIENT & INOCULATED
Total Chlorobenzenes and Total Chlorides vs. Time

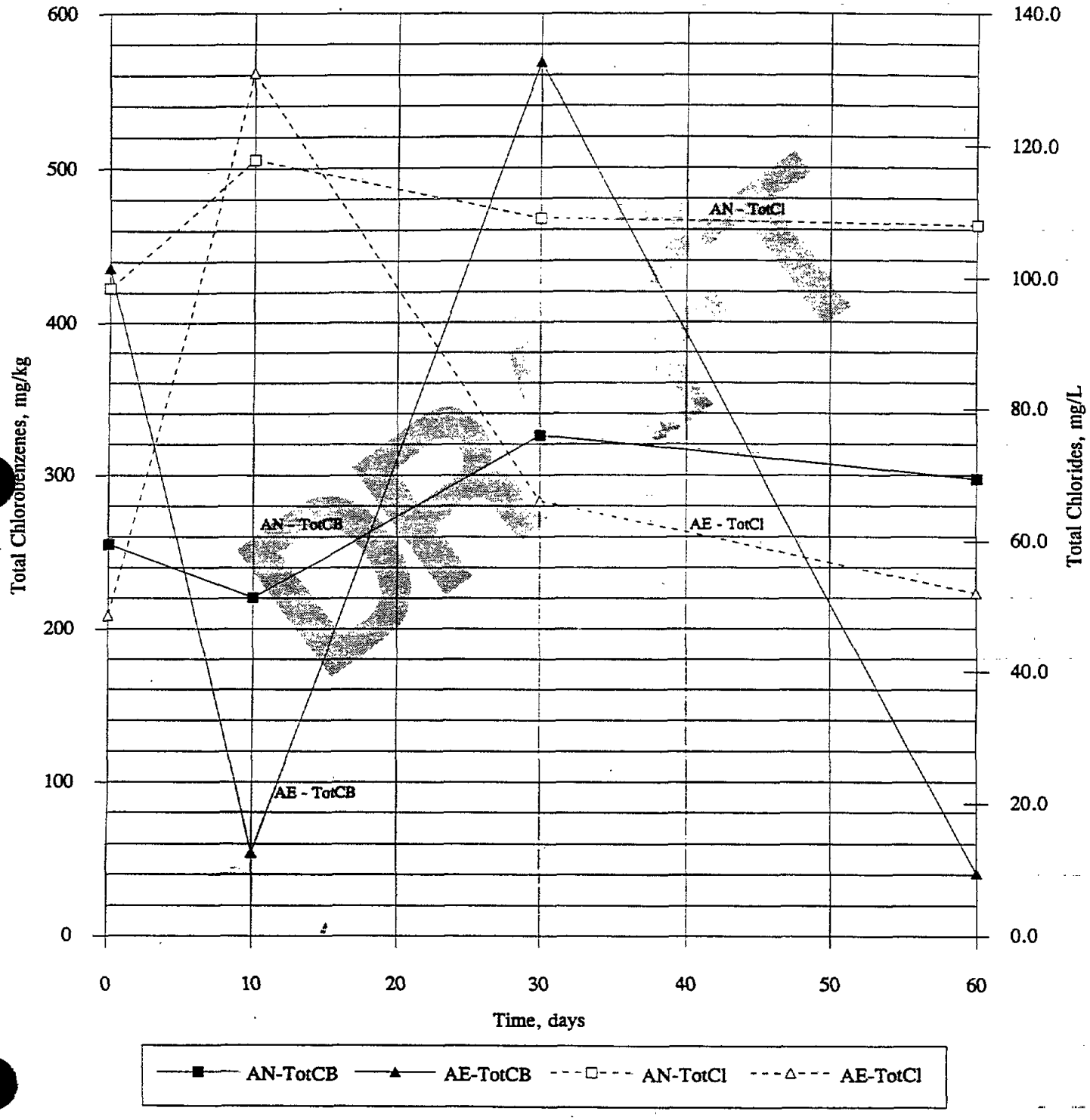


[NUTRINOC.XLW]ChrtB-NI

9/26/93

AR308297

SEDIMENT - NUTRIENT & INOCULATED
Total Chlorobenzenes and Total Chlorides vs. Time



[NUTRINOC.XLW]ChrtC-NI

9/26/93

AR308298